This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

BOSTON
MEDICAL LIBRARY

FOUNDED A.D. 1875
INCORPORATED 1877

IN THE
Francis A. Countway
Library of Medicine
BOSTON

THE

EDINBURGH
MEDICAL AND SURGICAL
JOURNAL:

EXHIBITING

A CONCISE VIEW

OF THE

LATEST AND MOST IMPORTANT DISCOVERIES

IN

MEDICINE, SURGERY, AND
PHARMACY.

VOLUME FORTY-NINTH.
1838.

EDINBURGH:
PRINTED FOR ADAM AND CHARLES BLACK:
LONGMAN, ORME, BROWN, GREEN & LONGMANS, LONDON:
JOHN CUMMING, AND HODGES & SMITH, DUBLIN.

1838.

ROS[illegible]ICAL
JUL 12 1905
LIBRARY.

4370

CATALOGUED
JUL 12 1905
E. H. B.

PRINTED BY JOHN STARK, EDINBURGH.

THE

EDINBURGH
MEDICAL AND SURGICAL JOURNAL,

No. CXXXIV.

CONTENTS.

PART I.—ORIGINAL COMMUNICATIONS.

ART. I. Statistical and Pathological Report of the Royal Infirmary of Edinburgh, for the years 1833, 34, 35, 36, and half of 1837. By JOHN HOME, M. D. . . . . Page 1
II. Report of Surgical Cases, treated in the Glasgow Royal Infirmary, during the years 1836–7. By WILLIAM DAVIDSON, M. D. 31
III. A Selection of Cases presenting aggravated and irregular forms of Hysteria; and an analysis of their phenomena. No. I.—Hysterical Ischuria. By THOMAS LAYCOCK, Surgeon, . 78
IV. An Experimental Investigation into the Functions of the Eighth Pair of Nerves, or the Glosso-Pharyngeal, Pneumogastric, and Spinal Accessory. By JOHN REID, M. D. . . 109
V. Observations intended to illustrate and determine the essential nature of Inflammation, deduced from its phenomena. By G. HUME WEATHERHEAD, M. D. . . . 176
VI. Cases of Poisoning by Fungi, with Remarks. By ALEXANDER PEDDIE, M. D. 192
VII. Case of Presentation of the Face, in which sphacelus or ramollissement of that portion of the Peritoneum connecting the Uterus with the Urinary Bladder occurred, followed by general Peritonitis and Death. By JOHN RENTON, Esq. Surgeon, . . 203
VIII. Account of a remarkable Case of Suicide, with Observations on the fatal issue of the rapid introduction of air in large quantity into the circulation during surgical operations. By P. D. HANDYSIDE, M. D. 209
Appendix to the Paper of Mr Laycock on Hysterical Ischuria, 221

PART II.—CRITICAL ANALYSIS.

ART. I. Mémoires de l'Académie Royale de Medecine, . . 222
II. Notice relative to the Plague of Moscow of the year 1771. By M. Gerardin, ... 233
III. Recherches Anatomiques et Physiologiques sur l'Organe de l'Ouie, &c. Anatomical and Physiological researches on the Organ of Hearing and Audition in Man and Vertebrated Animals. By GILBERT BRESCHET, ... 244
IV. Medico-Chirurgical Transactions, published by the Royal Medical and Chirurgical Society of London for 1836.
Medico-Chirurgical Transactions. General Index to the first Eighteen Volumes, ... 256

V. The British Medical Almanack, 1838; with a Supplement. Edited by **William Farr**, . . . Page 274
VI. A Treatise on the Malformations, Injuries, and Diseases of the Rectum and Anus. By **George Bushe**, M. D. . . 275
VII. On the Nature and Treatment of Diseases of the Heart, with some New Views of the Physiology of the Circulation. By **James Wardrop**, M. D. 291
VIII. Transactions of the Glasgow and Clydesdale Statistical Society, instituted April 1836. 1. An Account of the Former and Present State of Glasgow, comprehending its Commercial, Manufacturing, and Ecclesiastical Concerns. By **James Cleland**, LL. D. . 296
IX. 1. The Retrospective Address upon Medical Science and Literature, delivered at the Fourth Anniversary Meeting of the Provincial Medical and Surgical Association, held at Manchester, July 21st 1836. By **John Green Crosse**, Esq.
The Retrospective Address, delivered at the Fifth Anniversary Meeting of the Provincial Medical and Surgical Association, held at Cheltenham, July 19th and 20th 1837. By **James L. Bardsley**, M. D. 304

PART III.—MEDICAL INTELLIGENCE.

On the Yellow Colour of the Leaves in Autumn. By **Berzelius**, . 307
On the Red Colouring Matter of the Fruits, and on that of the Leaves in Autumn. By **Berzelius**, ... 309
A new mode of increasing the Heart's action for restoring the powers of life in persons apparently dead from drowning, or in syncope. By **John Hyslop**, Esq. Surgeon, ... 311
Observations on the employment of Gunpowder, as a medicine in various morbid states of the Gastro-Enteric Mucous Membrane. By **Robert Dick**, M. D. 312
Mr Law on the use of Arsenic in Plethora, ... 313
The Air Condenser applied as a Remedy in Cases of Deafness. By Dr **Kramer**, 316
Proposition by the Dublin College of Surgeons to regulate the Practice of Apothecaries, Druggists, and Dispensers, ... 317
Obituary, ... 320

Explanation of the Plates.

Plate I. Represents the section of upper lobe of left lung in Case 348, extensively affected with the acute form of the diffused tuberculation, degenerated into a chronic form, and displaying numerous excavations. One near the apex contained blood, and two vessels, under which a probe has been passed, are seen to cross from one wall to the other, the canals of which were quite pervious. The bronchial tubes entering cavities are much reddened.

Plate II. Perforation of the pleuræ followed by acute fatal pleurisy occurring in Case 361. A probe has been passed from the bronchial tube behind through the superficial cavity into the perforation, which was of an oval form, and situated about the middle of the upper lobe. The lung (the left) is much compressed, and covered with a thick coating of yellow lymph.

CORRIGENDA.

Page 150, line 23, *for* Brechet *read* Breschet.
— 163, — 19, *for* for *read* although.
— 168, note, *for* cervicale *read* cervicali.
— 134, line 2, note, *for* Paletta *read* Palletta.
— 276, — 9, *for* patient *read* partial.

THE EDINBURGH MEDICAL AND SURGICAL JOURNAL.

No. CXXXV.

CONTENTS.

PART I.—ORIGINAL COMMUNICATIONS.

ART. I. Report of the Royal College of Physicians of Edinburgh on the Adulteration of Drugs.—With Appendix. Observations on the Adulteration of Drugs. By Dr CHRISTISON, . . Page 321

II. On Laryngismus Stridulus, or Spasm of the Glottis. By WILLIAM KERR, Surgeon, ... 344

III. On the Evidence of the occasional Contagious Propagation of Malignant Cholera, which is derived from Cases of its Direct importation into new Localities by Infected Individuals. By JAMES Y. SIMPSON, M. D., ... 355

IV. Observations on Cholera as it appeared at Collieston and Footdee, Aberdeenshire. By JOHN PATERSON, Esq. Surgeon, . 408

V. On Epidemic Puerperal Fever. By J. T. INGLEBY, Esq. . 412

VI. A Selection of Cases presenting aggravated and irregular forms of Hysteria, and an Analysis of their Phenomena. No. II. containing,—1. Hysterical Hemorrhages. 2. Hysterical Nervous Affections. 3. Part of the Analysis. By THOMAS LAYCOCK, Surgeon, 436

VII. Notice regarding the Composition of James' Powder. By DOUGLAS MACLAGAN, M. D. 462

VIII. Contribution to Statistics of the Mortality among Horses in Cavalry Corps serving in the United Kingdom, together with the number of Horses cast, and some preliminary Observations respecting the Selection, Training, and Feeding of Horses belonging to Dragoon Regiments. By HENRY MARSHALL, Esq. . . 467

IX. Practical Observations on Chancre. By PHILIPPE RICORD, M. D. 474

X. Experiments and Observations on the Medicinal Properties of Euphorbium. By PAUL D. VEITCH, M. D. 483

XI. Case of Anthracosis or Black Infiltration of the whole Lungs. By THOMAS STRATTON, M. D. . . . 490

PART II.—CRITICAL ANALYSIS.

ART. I. Leçons de Clinique Medicale faites à l'Hotel-Dieu de Paris. Par le Professor A. F. CHOMEL, . . . 492

II. Report of the Proceedings under a Brieve of Idiotry, Peter Duncan against David Yoolow, tried at Coupar-Angus, 28–30th January 1837; with an Appendix of relative Documents, and an Introduction. By LUDOVIC COLQUHOUN, Esq. Advocate, . 530

III. Traité des Fièvres, ou Irritations Cérébro-Spinales intermittentes, d'après des observations recueillies en France, en Corse, et en Afrique. Par F. C. MAILLOT, . . . 571
IV. A Treatise on the Diseases and Injuries of the Larynx and Trachea; founded on the Essay to which was adjudged the Jacksonian Prize for 1835. By FREDERICK RYLAND, Surgeon, . 579
V. A Report of the Medical Management of the Native Jails throughout the Territories subject to the Governments of Fort William and Agra. To which are added, some Observations on the principal Diseases to which Native Prisoners are liable. The whole compiled in a great measure from Documents in the office of the Medical Board. By JAMES HUTCHINSON, A. M. . . 589
VI. A Letter to the Right Honourable Sir Henry Hardinge, K. C. B., M. P., on the Effects of Solitary confinement on the Health of Soldiers, in Warm Climates. By JOHN GRANT MALCOLMSON, Surgeon, 595
VII. De Inflammatione Ossium eorumque Anatome Generali, Exercitatio Anatomico-Pathologica. Auctore FRIDERICO MIESCHER.

PART III.—MEDICAL INTELLIGENCE.

Liquidization and Solidification of Carbonic Acid Gas, . . 599
On the grains of Teel or Till or Ramtilla, Nook in Abyssynia, Verinnua or Kutrello in Indostan, and the edible oil obtained from it, . 600
Diuretic operation of the Aralia hispida. By Doctor OLIVER PECK, . 601
Properties of the Ceanothus Americanus. By Dr HUBBARD, . . 601
On the Physiological and Therapeutic Properties of the Leaves of the Peach Tree, (Amygdalus Persica,) employed as a Sedative. By Dr ANTONY, 601
Analysis of a species of Clay found in the Canton of Richmond in America, which is sought by many persons, and especially by children, as food. By Professor COTTING, ... 602
Kreosote in Gonorrhœa, Gleet, &c. 602
An Appeal to Physiologists, ... 602
Acupuncture, Compression, and Iodine Injection employed for the cure of Hydrocele. By M A. VELPEAU, ... 603
Harveian Society. Notice to Students of Medicine, . . 604
Notice of Dr John Home's death, ... 604
Literary Notice, ... 604

Note.—Regarding the error which we noticed at p. 303, in January Number, as to 45 being stated to be the number of small-pox cases admitted, and of deaths by small-pox in 1836 in the Glasgow Royal Infirmary and Fever House, it appears that the admissions were 110, and the deaths 45.

BOSTON MEDICAL
JUL 12 1905
LIBRARY.

THE
EDINBURGH
MEDICAL AND SURGICAL JOURNAL.

1. JANUARY 1838.

PART I.

ORIGINAL COMMUNICATIONS.

Art. I.—*Statistical and Pathological Report of the Royal Infirmary of Edinburgh, for the years* 1833, 34, 35, 36, *and half of* 1837. By John Home, M. D., President of the Anatomical Society, Physician to the North-Western Dispensary, &c.

No. I. *Phthisis Pulmonalis.*

[Published by permission of the Honourable the Board of Managers.]

To the Editor of the Edin. Med. and Surg. Journal,

Sir,—You are aware that the Managers of the Royal Infirmary, towards the close of the year 1832, appointed an additional clerk, under the name of Pathological Clerk, whose duty it should be to perform all the *post mortem* examinations,—to draw out a particular account of the morbid appearances,—and to insert them in a Journal kept for the purpose, called the Register of Dissections, along with a short history of each case, extracted from the daily journals.

The number of cases in the Register now amounts to nearly 600. I have thought that the result of a *statistical analysis* of so many fatal cases, principally in reference to their pathology, but also in regard to some circumstances of the diseases previous to death, might be advantageously communicated to the profession through the medium of your widely circulated Journal. I shall add some remarks which the great opportunities of the above office have led me to make, since I was appointed to it in October 1833.

As the cases of *phthisis pulmonalis* are most numerous, amounting to 100, I shall consider them first, and have arranged them in a tabular form, which I drew out at first for my own convenience, but have been recommended to publish, as it will constitute a general view of the whole facts, from which every one may draw his own inferences. The numerous blanks in the Table in general arise from the examination being confined in several instances to the cavity of the chest, and even to the lungs, owing to the limited permission granted by friends; or in the case of unclaimed bodies, to the other organs being preserved entire for the anatomical schools. I am, &c. JOHN HOME.

29, *York Place*, *October* 30.

I shall follow nearly the order of the Table now given, and, in considering the results afforded by it, I shall arrange them under two general divisions. The first embraces the following circumstances in the history and progress of the disease during life; I. Sex, II. Age, III. Occupation, IV. Duration of the disease, V. The influence of Season, VI. Comparative frequency and Mortality, and, VII. Peculiarities presented by some of the symptoms. In the second division shall be considered the pathology of the disease under the following heads. I. The degree and frequency of the affection of the larynx and trachea; II. The nature and extent of the affection of the organs of the chest; and, III. The nature and extent of the affection of the abdominal organs.

DIVISION I.

I. *Sex.*—From the foregoing table it appears, that of the 100 cases of *phthisis pulmonalis*, 61 were males, and 39 females. On consulting the general weekly list of patients, the same predominance of the disease in males over females is found. From the beginning of 1833 to the end of June 1837, the period which this report embraces, there were admitted into the Hospital, labouring under phthisis, 185 males, and 112 females, whereas the total number of admissions during the same period was, of males, 4512; of females, 4749. This shows that the greater prevalence of the disease among males is not owing to their being admitted in greater numbers into the Hospital, for the case is exactly the reverse. Nor can it be entirely owing to the natural predominance of the male sex over the female in point of numbers, as Dr Clarke has supposed, the proportion being in our cases 10 males to little more than 6 females, whereas the relative number of the sexes is, according to him, 10 males to 8 or 9 females. Besides the cause assigned by Dr Clarke, it most probably arises from men being much more exposed than women to those causes that induce the disease, viz. to the inclemency of the seasons, to the inhalation of various irritating particles, dissipation, &c. The foregoing results differ widely from those given in a table by Dr Clarke in his excellent work,[*] especially those taken from the Parisian Hospitals, where the disease is more prevalent among females than males by about one-fifth.

II. *Age.*—The following Table shows the Ages of 96 of the cases, and how those are distributed between the two sexes.

Ages.		*Males.*	*Females.*	*Total.*
Below	20,	6	5	11
20 and under	30,	16	15	31
30	40,	21	8	29
40	50,	8	9	17
50	60,	4	1	5
60	70,	2	0	2
70	80,	1	0	1
Total,		58	38	96

It will be seen by the above table, that the greatest number of deaths occurred between the ages of 20 and 30, the next in proportion between 30 and 40, and the next between 40 and 50. The mortality above 50, and that below 20, is much less, being 8 for the first period, and 11 for the latter. These results agree remarkably with those arrived at by Dr Clarke,[†] from the numerous statistical tables he has examined. From the review of the above table it would appear that phthisis in this country prevails most between the ages of 20 and 40 inclusive, which period comprises 66 of the cases. Hippocrates[‡] fixed the period of its greatest prevalence between 18 and 35. This appears too early an age for the above cases. Only 3 of them were between 18 and 20: 18 were between 35 and 40. The opinion of Andral, that phthisis is more common among females below the age of 20, does not seem to be confirmed by the above table. Only 5 of the females died below that age. The larger proportion of them died after that age. It is remarkable that more females than males died between the age of 40 and 50, owing probably to the particular change in the female constitution at this period. Andral also found the mortality among women considerable at this period.

III. *Occupation.*—The following is a list of those whose occupations were known.

5 Masons
4 Painters
3 Sailors
3 Carpenters
3 Hawkers
1 Writer
1 Image-maker
1 Brass-founder
1 Slater
2 Jewellers
2 Porters
2 Servants
1 Baker
1 Wheel-wright
1 Tailor
1 Shoemaker
1 Bookbinder
1 Washerwoman
1 Ballad-singer.
1 Printer
1 Labourer
1 Groom
1 Cutler
1 Flax-dresser
1 Iron-founder
1 Bookseller

Masons form the most numerous class in the above list. Besides being much exposed to the vicissitudes of the weather, and engaged in a trade which renders them liable to the inhalation of minute particles of various kinds, both siliceous and calcareous, they are in general much addicted to the use of spirituous liquors, by which they induce that cachectic state of the system favourable to the development of tubercles. It is probably for the same reason that painters are liable to the disease. Their occupation also is an unhealthy one, as it exposes them to the inhalation of noxious particles.

---

[*] On Consumption, p. 183. [†] Op. cit. p. 179 [‡] Coac. progn. 439.

IV. *Duration.*—The following table shows the duration of the disease in 87 of the cases, and how far this is influenced by sex and age.

Duration.	*Male.*	*Fem.*	*Tot.*	*Age.*
14 days,	1	0	1	58
16	1	0	1	38
3 weeks,	1	1	2	40 m. 27 f.
4	0	1	1	37
5	0	1	1	26
6	1	1	2	40 m. 40 f.
7	1	0	1	22
2 months,	1	0	1	31
2½	1	0	1	39
3	4	2	6	30, 70, 64, 52 m. 32, 32 f,
3½	0	1	1	58
4	5	5	10	17, 22, 30, 36 m. 9, 9, 23, 27, of 2 not known.
5	4	4	8	18, 24, 28, 40 m. 17, 22, 24, 48 f.
6	4	2	6	4, 23, 31, 32 m. 32, 43 f.
7	2	3	5	21, 52 m. 21, 33, 36 f.
8	1	1	2	37 m. 24 f.
9	1	0	1	36
10	1	0	1	25
11	1	0	1	23
12	2	4	6	34, 36 m. 8, 21, 40, 45 f.
14	2	1	3	30, 35 m. 22 f.
15	1	1	2	27 m. 14 f.
18	2	0	2	23, 28
2 years,	3	1	4	4, 39, 46 m. 29 f.
2½	1	0	1	53
3	6	0	6	6, 28, 30, 31, 46, age of 1 not known.
4½	1	1	2	63 m. 49 f.
5	1	0	1	33
Several years,	5	3	8	21, 23, 30, 34, 42 m. 28, 29, age of 1 not known
Total,	54	33	87	

From the above table, it may be observed that 49 of the cases, or considerably more than one-half, die within eight months of the commencement of the disease; and that of these 38, or about three-fourths, die between the third and eighth month. Dr Clarke* has come to nearly the same conclusions, from the examination of the cases of Bayle and Louis.

As to the influence of sex in the duration of this disease, the foregoing table shows that 27 of the males, or one-half, die in the first eight months, and that 22, or two-thirds, of the females die within the same period; from which it appears that its duration is much shorter in the female than in the male sex. Louis † also found that the mortality among the females was much greater within the first year than among the males.

---

* Op. cit. 165.

† Recherches sur la Phthisie, p. 186. Paris.

The above table also shows that age has little effect on the duration of phthisis; for it will be seen from it, that after the different periods of duration, it proved fatal to persons of very various ages. Nor is it found that the acute cases were more common in young persons, as Louis was led to conclude from his experience. On the contrary, most of those in whom it proved fatal after a very short duration were considerably advanced in years.

V. *Season.*—The following table has been constructed from the general lists of the Infirmary, from the beginning of 1833 to the end of 1836, to show how the admissions and deaths in phthisis are distributed over the different months of the year.

Months.	*Admissions.*	*Deaths.*	*Months.*	*Admissions.*	*Deaths.*
January,	24	13	July,	23	22
February,	17	15	August,	26	13
March,	19	12	September,	21	9
April,	20	6	October,	25	11
May,	21	12	November,	24	13
June,	30	14	December,	30	14

It appears from the above that most admissions of persons labouring under this disease take place in December and June, the months of midwinter and midsummer, a coincidence which was not to be expected. But it is more remarkable that by far the greater number of deaths occur in July, one of the mildest months in this climate. Taking the three summer months together, it will be found that more deaths take place in these months than during any of the other seasons. The greater number of Bayle's cases also died during summer. And in Glasgow, according to the mortality bill of 1836, this season is also the most fatal for phthisical patients. The cases from these three places have been arranged together in the following table, according to the seasons of the year in which they proved fatal.

Season.	*Paris.*	*Edinburgh.*	*Glasgow.*	*Total.*
Winter,	58	40	318	416
Spring,	54	33	333	420
Summer,	68	48	361	477
Autumn,	64	33	304	401
	244	154	1316	1714

I apprehend that we can explain satisfactorily this increased mortality in the summer months, when we reflect that the greater number of cases commence in the winter and early spring months; that being prolonged into the summer they arrive at that period in the duration of the disease in which most deaths occur, viz. between the third and eighth month. Comparatively few, therefore, survive this season. The exhausting heats, also, may have the effect of increasing the hectic symptoms, and thus may hurry on the fatal termination. I state this with great deference to Dr Clarke, who, from the examination of the London bills of mortality by Dr Heberden, adopts the common opinion, that the winter months prove most fatal to phthisical patients. I am inclined, however, to think that in these tables many chronic affections of the chest, attended with emaciation, such as chronic pleurisies, chronic bronchitis, and emphysema, were included under the head of consumption,—the diagnosis of that disease not having arrived in the days of Dr Heberden at the degree of perfection it has attained since the time of Laennec.

VI. *Comparative frequency and mortality.*—In order to show these, I have extracted from the general lists the number of admissions and deaths in phthisis, continued fever, and in all diseases,[*] and arranged them in the following table.

Diseases.	*Admissions.*			*Deaths.*		
	Males.	*Females.*	*Total.*	*Males.*	*Females.*	*Total.*
Phthisis pulmonalis,	185	112	297	89	81	170
Continued fever, -	1652	1961	3613	271	215	486
All diseases, -	4512	4749	9261	688	563	1251

The fequency of phthisis in the Infirmary may be estimated by comparing the number of phthisical patients admitted with the total number admitted labouring under all diseases. It is found to amount to one phthisical case for every 31 and a fraction patients admitted, in other words, it forms about one-thirtieth part of the whole admissions. Continued fever, on the other hand, forms somewhat less than the half of the whole admissions.

On comparing the deaths in phthisis with the number of admissions in the same disease, we find that they stand in the relation of 1 to 1.7; the deaths in fever to the admissions in fever, as 1 to 7.4; and the whole number of deaths to the whole number of admissions, also as 1 to 7.4, so that in phthisis one patient nearly in every one and a-half admitted dies, whereas in fever and all other diseases, one only dies in every seven and a-half. In the case of fever, this may be reckoned as the proportion of the deaths to the recoveries, whereas in phthisis it can be only reckoned as the relation of the deaths to those that are dismissed.

It appears that more women die of phthisis in proportion to those admitted than men, which may be accounted for by the disease proving sooner fatal in the one sex than in the other; or perhaps it may be owing to the stay of women in hospital being more prolonged than that of men. On the contrary, in fever, and in all diseases, the mortality among the men is greater than among the women, although more of the latter are admitted than of the former.

As to the mortality in phthisis in comparison with the general mortality, it is found that it is as 1 to 7.35, in other words, it forms a little less than one-seventh * of the whole mortality. The relation of the mortality in fever to the general mortality is as 1 to 2.5, or somewhat less than one-half of the whole mortality. It is to be remembered that the above results are to be considered only as applicable to phthisis as it occurs in the Royal Infirmary, not to the disease generally. Many patients labouring under the disease never apply for admission, and several of those applying for admission are rejected, especially when there are numerous applications by patients labouring under more curable diseases. On the contrary, the greater number of fever cases that occur in the town are sent to the hospital, and none are ever rejected. The above results, therefore, if applied to these two diseases generally, would give a very unjust preponderance to the frequency and mortality of fever over those of phthisis.

---

[*] The surgical diseases are not included.

VII. *Symptoms.*—The symptoms of *phthisis pulmonalis* are now so well known, and detailed at such length by systematic authors, that an account of them need not detain us long in a report of this kind, which treats principally of the pathology of the disease. Some symptoms, depending upon particular lesions, will be more properly considered after detailing these. It may only here be mentioned, that what have been called in the table *usual symptoms*, viz. cough, dyspnœa, night-sweats, emaciation, &c. occurred in the greater number of cases.

Hæmoptysis is mentioned as having occurred in 26 of the cases. In the greater number of these it was in small quantity, and only occasionally. In 4 only was it in considerable quantity; in 2 of these, in all probabilty, it arose from the erosion of large vessels, which had remained unobliterated.

Affection of the Stomach, denoted by pain in the epigastrium, nausea, vomiting, occurred in 10 of the cases. In 3 of these the stomach seemed to be the organ primarily affected, the affection of the lungs being secondary to it. In the others the stomach was affected simultaneously with, or subsequently to, the organs of the chest.

Dropsical symptoms were observed in 6. It will afterwards be seen whether these were connected invariably with affection of the heart, as some suppose. Palpitations occurred in 4. In 1 these were connected with disease of the heart.

DIVISION II.

We shall now pass on to the more particular object of this paper,—the pathology of the disease.

The organs of the head were examined in a few cases only, and in all of these were found healthy.

---

* This is very different from the experience of M. Louis, Op. cit. p. 187, who calculated that one-half the patients in La Charité died phthisical.

I. LARYNX AND TRACHEA.—According to the general tabular view of the whole 100 cases, ulceration of the larynx was found in 5 only; but as these organs were seldom examined, except when symptoms referable to them occurred during life, the relative proportion of those in which they were sound to those in which they were found diseased cannot be ascertained. I am confident, however, that these organs are much less seldom affected in this country than in France, where M. Louis* found them affected in one-fourth of his cases, and Andral † in three-fourths. In nearly all the cases the ulcers were of small extent, and superficial, occupying chiefly the interior of the *epiglottis*, parts about the *rima glottidis*, *chordæ vocales*, *&c.* In one case the *epiglottis* had been partly destroyed by the ulceration. There was generally at the same time slight thickening of the neighbouring parts, accompanied occasionally with the deposition of a yellow matter, apparently, into the submucous tissue. The trachea was less seldom affected than the larynx, being found ulcerated in one of the cases only, in which perforation of all the coats between two of the rings had taken place. I believe with M. Louis, that such ulcerations of the larynx and trachea are peculiar to phthisis, never having found them in the examination of patients who had died of other diseases, except in syphilis, in which disease, however, the ulcers are much deeper, and attended with much more thickening of the surrounding tissues. In some of the cases, instead of ulceration, a redness of the membrane lining these organs was the only lesion found, not confined to either side, as mentioned by Louis, but generally in detached patches, or diffused over a large space. In none of the cases was any thing like round hard tubercles detected, as described by Andral and others.

These lesions of the larynx and trachea gave rise in all the cases to prominent symptoms; to a cough of a peculiar character; to hoarseness, amounting in some to aphonia; to pain about the larynx, &c. In one case, in which most of these symptoms were well-marked, the larynx and trachea were found quite sound.

II. THE NATURE AND EXTENT OF THE AFFECTIONS OF THE ORGANS OF THE CHEST—1. *The Lungs.*

A. *Tuberculation.*—This, which has been considered since the time of Laennec the essential lesion in *phthisis pulmonalis*, occurred in all the cases. The tubercular matter assumes two very different forms in the lungs, the one a hard, almost cartilaginous semitransparent substance, varying in colour from light-gray to perfect black, to which Laennec, and afterwards Louis,‡ gave the name of *gray semitransparent matter*; the other, a light-yellow opaque substance, of variable consistence, sometimes nearly as hard as cartilage; at other times soft and friable, like some kinds of cheese, which the above pathologists called *Crude Tubercle.* They supposed that these two varieties of tubercular matter were closely allied to one another; that the gray semitransparent matter, in beginning to soften, necessarily passed into the yellow,—a process which, according to them, commenced in the centre of each mass; and that the yellow matter was never deposited primarily without passing through the previous stage of grayness and semitransparency. Many recent pathologists, however, are now of opinion that these two forms of tubercular matter, though frequently found associated, and the one even springing up in the centre of the other, yet for the most part are independent of one another. Laennec* himself, from the following passage, seems to have been quite aware that cases do occur where the yellow matter is found without any trace of the gray: "The conversion of the gray and gelatinous infiltration into yellow tuberculous matter is sometimes so rapid, that in examining lungs containing large masses of the latter (yellow,) we sometimes find no trace of the former (gray,) although there can be no doubt that the one originated in the other." He was, however, so wedded to his favourite theory of the conversion of the one into the other, that he endeavoured to account for the absence of the gray matter by its rapid conversion into the yellow. It will afterwards be seen, that a similar yellow tubercular deposit was found in several of the cases, without any of the gray matter being anywhere visible; that in all of them the symptoms during life indicated that an acute action had been going on in the lungs; and that its presence in these organs was always associated with appearances known to be the result of inflammation.

---

* Op. cit. p. 48.

† Clin. Med. Vol. iii. p. 191.

‡ Op. cit. p. 3.

It appears to me that both these varieties of tubercular matter are generally the result of inflammatory action; and that the great difference between them consists in the yellow being the result of an inflammatory action, acute at the commencement, but very liable, in some constitutions, to degenerate into a chronic form; whereas the gray semitransparent matter is the result of an inflammatory action, which is chronic from the beginning.

Tubercular matter, whichever of these two forms it assumes, it may now be concluded, from the labours of recent pathologists, among whom the name of Dr Carswell † stands pre-eminent, is situated, for the most part, in the air-cells, and in the smaller branches of the bronchi. On this idea, I think it may be called, 1. Simple Tubercle, when situated in single air-cells; 2. Aggregate Tubercle, when deposited in several contiguous air-cells, or the whole of those constituting a lobule; and, 3. Diffused Tuberculation, when occupying several contiguous lobules, a whole lobe, or an entire lung. Each of these may be subdivided into the *gray* or the *yellow*, as they consist of the one or the other of the varieties of tubercular matter.

---

* On Diseases of the Chest, Forbes' Translation, p. 277,

† Cyclopædia of Med., Art. Tubercle.

This division of tubercles, by substituting a cell of the cellular texture for air-cell, may be equally adopted by those who suppose them to be situated, not in the air-cells, but in the cellular tissue, of the lung, and is much the same as that of M. Gendrin, who was of the latter opinon.

a. SIMPLE TUBERCLE.—Corresponding to the *miliary tubercle* of Laennec, to the *simple tubercle* of Lombard, and to the *disseminated tubercle* of Gendrin. Of this there are two varieties, the gray and the yellow.

α. Gray Simple Tubercle, corresponding to the *miliary granulations* of Bayle, * and to the *gray granulations* of Laennec and Louis. They formed the principal lesion in five of the cases, (No. 112, 139, 206, 242, and 419.) In all their appearance corresponded accurately to the description of them given by Laennec.† They were more generally diffused over the lungs than some of the other forms of tubercle ; but were more abundant, and more crowded together in the upper lobes, where also they began first to undergo ulterior changes. In two of the cases the left lung was more occupied by them than the right ; in the other three both lungs had them in nearly equal quantity. The ages of those in whom they occurred were the following, 22, 23, 31, 37, and 39, so that they are more common in adult age. One only was a female, the other four were men.

Pathologists differ in their opinion as to the nature of this kind of tubercle. Bayle, who was the first to describe them, considered them to differ entirely in their nature from common tubercles ; that they approached more to the nature of accidental cartilages; and that they constituted a peculiar species of phthisis under the name of *phthisie granuleuse.* M. Laennec and Louis thought they formed the primitive stage, or nascent form of the common crude tubercle. Broussais ‡ took them for enlarged lymphatic glands, while more lately Andral § has ascribed their origin to acute inflammation of individual vesicles, constituting in their early stages small red soft tumours. That they may have their origin in this *acute* form, cannot be denied, as it rests on such great authority ; but I apprehend that in this country this mode of their formation is extremely rare. Although I have carefully examined the lungs of upwards of 500 individuals, yet I have never met with the appearance described by Andral. On the contrary, granulations in

---

* Recherches sur la Phthisie, p. 26. Paris, 1810. † Op. cit. p. 273.

‡ Sur les Phlegm. Chron. § Op. cit. p. 11.

their hard semitransparent state are far from being an uncommon appearance in the lungs, even of those who have not manifested any phthisical symptoms during life. These simple gray tubercles appear to me to be the result rather of a chronic inflammation of the individual air-cells, giving rise to the effusion of a concrete lymph on their lining membranes, which, gradually accumulating from the circumference to the centre, at last fills the whole of their cavities. Occasionally their central portions remain empty, producing the appearance of central depressions, when these tubercles are divided. At other times they contain in their centres a kind of inspissated mucus, giving rise to the appearance, as Dr Carswell * has observed, of central softening, so much insisted on by Laennec. More rarely these tubercles contain in their centre bodies derived from without, as grains of sand. A remarkable case of this kind was exhibited some time ago to the Anatomical Society by Dr J. Y. Simpson, occurring in a stone-mason, both of whose lungs were extensively studded with hard dark gray miliary tubercles. Each of these on being divided contained in its centre a minute earthy particle, which on examination was found to consist of silica and carbonate of lime. These particles had no doubt been inhaled from without, had lodged in the several air-cells, and given rise to a chronic inflammation of their lining membrane, followed by the effusion of a concrete lymph, which had gradually included in its substance the offending body. † These tubercles, being the result of a slow process, may exist in considerable quantity in the lungs without giving rise to any symptoms. The surrounding pulmonary tissue is then generally in a healthy condition, or the air-cells have become dilated, by which they are enabled to perform a kind of supplementary respiration. In this state the chest affords a clear sound on percussion, and a puerile respiration is heard by the stethoscope. In all those cases where urgent phthisical symptoms had preceded death, the intervening pulmonary tissue was much loaded with frothy and bloody serum, or it was much condensed, and of a bright salmon-red colour. This morbid action going on in the surrounding tissue, caused no doubt by the irritation of the tubercles, is the principal cause, I apprehend, of the very urgent dyspnœa and fever which occur in these cases. The same thing happens in other organs of the body. Tumours of the brain, the result of a chronic process, often remain in a similar latent state, till at last they suddenly give rise to serous effusion into the surrounding substance of the

---

* Cyclop. of Med. Art. Tubercle.

† Since writing the above, I have been informed that a portion of the same lungs was exhibited to the Medical Section of the British Association, lately assembled at Liverpool, by the late Dr Mackintosh, who threw additional light on the nature of these particles by stating, that their composition was exactly the same as had previously been found by Dr Gregory to be that of the stone of the Craigleith Quarry, in which the man laboured as a quarryman.

brain, or into the ventricles, and thus cause sudden, and often urgent cerebral symptoms. Tumours on the serous membranes, the result of chronic inflammation, occasionally give rise also to sudden effusions of serum into the cavities lined by them. Most of the above five cases, which have been given as examples of miliary tubercles, had lasted for some time previous to the coming on of the urgent symptoms. The tubercles were in all probability formed during this period. In the interesting case of the lad cited by Dr Alison * in his excellent paper on the formation of Tubercles, it is probable, that the tubercles were formed during the attack for which he was first brought into the hospital. From this he recovered, went out and exposed himself to cold, and was readmitted with urgent symptoms, caused in all probability by the morbid action going on in the pulmonary tissue surrounding the tubercles, which we are told was of a redder colour than usual, much loaded with serum, and in parts condensed.

The diagnosis of this kind of tubercles during life is allowed by Louis and Dr Clarke to be very difficult. Percussion generally causes a dull sound if the pulmonary tissue is much condensed or loaded with serum. It often, however, retains so much air from the previous dilated state of the air-cells, that little dulness of sound is produced by percussion. The stethoscope generally indicates the existence of different râles from the accompanying bronchitis. I have noticed in two of the cases a very peculiar modification of the crepitous râle, much resembling the creaking of Russia leather, occurring principally during expiration. I was so struck with it in the case of Stewart (112,) that when I again heard it in the case of Crawfurd (242,) I was led to give the diagnosis, which I did, to Dr Craigie, that miliary tubercles would be found diffused through the lungs, along with engorgement of the surrounding pulmonary tissue. I conceive this râle to be produced in the same way as the crepitous râle, so satisfactorily explained by Dr Williams, modified by the different nature of the fluid contained in the bronchial tubes.

β. *Yellow Simple Tubercle*, called by Laennec *Crude Miliary Tubercle.*—These are more rarely diffused singly over the lungs than the gray variety. More commonly they are associated in groups. They are, however, occasionally seen disseminated through the lungs of children who have died of pectoral affections, following some of the febrile exanthemata, as small-pox and measles, the surrounding lung being generally in the state of red hepatization. I have seen them also in the lungs of adults, affected with pneumonia which had reached the third stage or that of suppuration. They are distinguished in this situation from the surrounding parts by their bright yellow colour; and they have generally a soft consistence. It was this species of tubercle that was commonly produced in the lungs of rabbits into which mercury had been injected by Cruveilhier,* Dr Kay,† and others. Each tubercle contained in its centre a minute globule of mercury, to the irritation of which it no doubt owed its origin. Laennec considered that the yellow tubercle always originated in the gray, by a yellow point commencing in their centre, and "that the only difference between them was that which exists between a ripe and a green fruit." It is possible that the gray substance may occasionally form a nidus for the deposition of the yellow, but that the latter always originates in the former cannot now be maintained. As the gray tubercles are in all probability the result of a chronic irritation of individual air-cells, so are the yellow the effect of a more acute irritation. When recent they are generally associated with appearances, which are the acknowledged results of inflammation. When they have been deposited for some time, these tubercles, like the yellow tubercular matter in general, become harder from compression or from absorption of their fluid parts, and the surrounding pulmonary tissue often regains its healthy condition.

---

* Medico-Chirurgical Transactions, Vol. iii. part i. p. 287.

b. AGGREGATE TUBERCLE.—*the Multiple Tubercle of Lombard—Agglomerated Tubercle of Gendrin.*‡—Laennec and Louis have no distinct appellation for them, except it be *groups* of tubercles or *tubercular masses.* They are formed by the filling up of several contiguous air-cells, or the whole of those constituting a lobule with tubercular matter. They vary much in size, from that of peas to that of walnuts. Like the simple tubercle, they may be subdivided into the gray, and the yellow aggregate tubercle.

a. The Gray Aggregate Tubercle varies much in size and shape, according as few or many of the air-cells of a lobule are filled with tubercular matter. Like the gray granulations they are very hard, generally semitransparent, and vary in colour from a light-gray to nearly black. The different portions of the same aggregate tubercle often exhibit those various shades of colour, according as the several simple tubercles of which it is composed are more or less tinged with the black pulmonary matter. When attentively examined, we can sometimes distinguish the different simple tubercles of which they are composed, each of them with a depression in its centre, or a yellowish point. Occasionally they contain in their substance siliceous particles, which occurred in one of the cases in the table (412), a mason. Generally, however, their structure is so homogeneous that the separate tubercles of which they are composed, cannot be distinguished even on the most attentive examination. They give in most cases a crenated form to the circumference of each aggregate tubercle. I apprehend that they have an exactly similar origin to the simple gray tubercles or miliary granulations.

---

* Nouv. Bibl. Med. September 1826.

† Ed. Med. Chir. Trans. Vol. iii. p. i. p. 300.

‡ Essai sur les Tubercle. Paris, 1827.

β. Yellow Aggregate Tubercle.—Those, like the former, vary much in size and shape. When recently deposited, as we occasionally see them, in the lungs of children after acute inflammation, following the febrile exanthemata, they often assume a star-like form, or an arborescent appearance, arising from the tubercular matter having filled a few only of the terminal branches of a bronchial tube. This arrangement is well seen in Dr Carswell's plates.* When the whole cells of a lobule are filled with this yellow tubercular matter, the aggregate mass assumes the shape of the lobule in which it is formed. This is seldom at first round, but angular and lozenge shaped. The round form, I believe, of these tubercles is afterwards assumed when they have been for some time deposited, and is owing to the pressure being equal on all sides. This has the effect also of making their texture, which was at first soft and friable, hard and compact. I conceive them to arise from acute inflammation of the lining membranes of several contiguous air-cells, or those of a whole lobule. When soft and recently deposited, they are generally associated with other known effects of inflammation, such as red hepatization of the surrounding pulmonary tissue, lymph on the neighbouring pleura, which, as observed by Dr Alison,† in all respects resembles the matter effused into the substance of the lung. But if they should be found, as occasionally they are, in their soft recent state, without their being accompanied with any marks of surrounding inflammation, I do not consider this as an argument against their having had an inflammatory origin. Lobular peripneumonies are often seen surrounded by perfectly healthy tissue. In the same way we can conceive the inflammation giving rise to these tubercles, limited to the single lobules in which they are formed. There is a great analogy between this kind of tubercle when recent and lobular peripneumonies; indeed it appears to me the only difference is, that the latter go on more rapidly to suppuration forming abscess. I have had numerous opportunities of witnessing them in the lungs of those who have died after capital operations. They are often mistaken by surgeons for tubercles, and are supposed to have existed previous to the operation. I agree with M. Blandin‡ in thinking that they are the only source of the purulent deposits that so often take place in the lungs after operations.

Aggregate tubercles of both kinds being formed by the filling up of several or of the whole air-cells of a lobule by tubercular matter, necessarily include within their substance the parenchymatous structure of the lung, consisting of the parietes of the air-cells, the intervesicular cellular tissue, and the blood-vessels which ramify between and on the membrane of the air-cells. The two first structures may often be seen, on attentive examination of the section of one of these tubercles, much thickened, and associated with masses of black pulmonary matter. The blood-vessels are generally soon obliterated by the pressure of the tubercular matter, so that they are very seldom seen carrying red blood. When observed, as they have been lately by my friend, Dr Kingston,* I apprehend they afford no proof of the organization of tubercular matter.

---

* Fascic. i. pl. 1. fig. 1. † Ed. Med. Chirurg. Trans. Vol. i. 1824, p. 410.

‡ Journal Hebdomadaire.

c, DIFFUSE TUBERCLE, OR DIFFUSED TUBERCULATION OF THE LUNG, otherwise called by Laennec, Louis, Gendrin, &c. *Tubercular Infiltration*, is formed when several contiguous lobules, a whole lobe, or a whole lung are occupied by the tubercular matter. Like the others it consists of two varieties.

a. The gray Diffused Tuberculation corresponds to the *gray tubercular infiltration* of Laennec,† to the *chronic peripneumony* of Andral.‡ When of a very dark-gray colour, Bayle§ mistook it for melanosis, and thought it constituted a distinct species of phthisis, to which he gave the name of *phthisie avec melanose*. Like the two other kinds of the gray semitransparent tubercle, it varies in its shade of colour from a very light gray to nearly perfect black, arising from its being more or less tinged with the black pulmonary matter. These shades of colour are often so variously intermixed with one another, that the general mass assumes a very variegated colour, resembling some kinds of gray marble.‖ Its texture is very homogeneous, and generally cuts like cartilage. The thickened interlobular septa may occasionally be seen traversing the hardened mass in various directions; and even the separate air-cells filled with the gray semitransparent matter are sometimes observed. ¶ The gray diffused tuberculation, I believe, with Dr Williams,** to consist of the same matter as the miliary granulations, only diffused over a large space. Like these also I conceive it arises from a chronic inflammation of the air-cells widely diffused. It occasionally exists alone, unassociated with any of the yellow tubercular deposition. More commonly, however, the latter is diffused in points and masses through it. In some cases this may arise from a subsequent process of irritation going on in the gray semitransparent matter, which is the opinion of Dr Williams. I am more inclined to ascribe their origin to a subsequent acute action going on in some of the air-cells and lobules, which have escaped being filled up by the gray matter, the result of a more chronic action. The smaller points may arise from the process of softening commencing in the centre of the individual tubercles. This kind of tubercular disease is found at all ages, but more commonly in those advanced in years, and in them also it is less associated with the yellow tubercular deposition.

---

* Lond. Med. Chirurg. Trans. 1836.

† Op. cit. p. 270.

‡ Clin. Med. Vol. iii. p. 230.

§ Op. cit. p. 28.

‖ Vid. Hope's Plates, fig. 47.

¶ Vid. Carswell's Plates, fig. 47.

** On Diseases of Chest, 1835, p. 130.

β. *The yellow diffused Tuberculation*, corresponding to the *yellow tubercular infiltration* of Laennec, Louis, and Andral. I presume it is to this kind of tuberculation to which Dr Graves gives the name of *scrofulous pneumonia*. Dr Carswell, without giving it a distinct appellation, compares it to *boiled liver*. It forms the first two varieties of phthisis in the division of Dr Stokes. When it has assumed a chronic form, and gone on to ulceration, it forms the *phthisis a peripneumonia* of Morton. It occurred in ten of the cases, (Nos. 190, 212, 332, 385, 399, 421, 464, 529, 547, and 552.) The lung occupied by this kind of tubercular deposit, when recent, is of a light yellow colour, dense, but at the same time friable. It is very granular on the cut surface indeed when broken up it seems entirely composed of little granular bodies, set close together, compared by Laennec to the eggs of certain insects closely compacted. These grains are evidently the air-cells filled with the yellow matter. A lung in this state is often, I believe, thought to be in the third or gray stage of peripneumonia, from their similarity in appearance, and from symptoms very like those of pneumonia having preceded death. The tubercular, however, may be distinguished from the pneumonic affection, by being of a light yellow colour, sometimes approaching to white, much more granular on the cut surface, and in not yielding a drop of fluid on the strongest pressure. When it has been deposited for some time, it loses it bright yellow colour, becomes harder, and assumes a darker colour, from being more tinged with the black pulmonary matter. In this stage it very much answers the description of the chronic peripneumony of Laennec,* which, he says, occasionally is to be met with around tubercular excavations. When we have an opportunity of examining this kind of tubercular matter in the act of deposition it will be seen to be deposited in detached patches in a portion of lung already in the state of red hepatization. These patches assume the lozenge-shaped form of the lobules, and as these lobules become successively invaded by the yellow matter, the patches begin to approximate each other, at last coalesce, and thus a large portion of lung becomes, in the language of Laennec, infiltrated with this tubercular matter. Laennec, † from the following passage, seems to have been quite aware of this mode of its deposition. When treating of the yellow tubercular infiltration, he says, " This form is found in different points of the lungs, in masses of a yellowish-white colour, much paler, duller, and less distinct from the substance of the lungs than the common crude tubercles. These masses are *irregular*, *angular*, and never have the nearly round shape of ordinary tubercles." But I believe Dr Hope to be the first that accurately pointed out this mode of its deposition by lobules, and has admirably illustrated it in his plates, to which I refer the reader.[*] It appears to me that it is always deposited in this way, and though in general, when occupying a large space, it loses the lobular form, yet it occasionally retains it, a good example of which is given in Dr Carswell's plates,[†] where the interlobular partitions are seen dividing the tubercular deposit into angular portions.

---

* Op. cit. p. 233. † Op. cit. p. 277.

This kind of tuberculation occurred in persons of all ages, from eighteen to fifty-eight. It is not peculiar to those of a *tuberculous* constitution. Besides those examples of it given in the table, it occurred in many persons above middle age, who had long laboured under chronic affections of the chest, as chronic bronchitis, and aneurisms of the aorta, in whom it seemed to have supervened shortly before death, and to have been the immediate cause of the fatal termination. Acute symptoms of more or less intensity, resembling those of pneumonia, occurred before death in all the cases. In one (421) the duration was only fourteen days, in another (464) sixteen days. In (212) the urgent symptoms lasted only three weeks. In the others, though they had laboured under pectoral symptoms for some time, yet these became more urgent previous to death. The pulse in all was considerably above 100, and the dyspnœa very great. Crepitous rale is mentioned as having been heard in two. The appearances on dissection were very similar to those found in general, as the effect of inflammation of the lung. In some of the cases parts of the lung were infiltrated with serum; in all but two, the pulmonary tissue between the tubercular deposits was found in the state of red hepatization; in five yellow lymph, very similar to the matter constituting the tubercular deposit, as noticed by Dr Alison,[‡] covered the *pleura pulmonalis*, generally without serum, as in *pleuro-pneumonia*, in one case associated with effusion of serum. Another circumstance, strikingly in proof of the analogy of these cases with pneumonia, is the more frequent affection of the right lung. In three it was alone affected, in four it was more affected than the left, in two they were equally affected, in one only was the left lung more affected than the right.[§]

---

[*] Vid. fig. 17, 21, 23. [†] Fig. 1, pl. 3. [‡] Ed. Med. Chir. Trans. 1824, p. 410.

[§] It differs from pneumonia, however, in more frequently affecting the upper lobes. Of the ten cases, in four the lower lobes were alone affected, in three the upper, in one

From all these circumstances, I think there can be no doubt, that this yellow diffused tuberculation is the effect of acute inflammatory action going on in the lungs. Indeed, this is not denied by Dr Clarke,* who otherwise is a great opponent of the inflammatory origin of tubercles. If we ascribe this origin to the diffused form of the yellow tuberculation, we must allow that the same matter, when confined to single lobules, or to single air-cells, has a similar origin. What, then, it may be asked, is the difference between pneumonia and acute tuberculation of the lungs, since they both consist in inflammation? I conceive that they differ in their seat. Common pneumonia, I think, is seated not in the air-cells of the lungs, as many seem to suppose, but in the cellular tissue intervening between them, and in that separating the lobules; and that it is very analogous to diffuse inflammation of the cellular tissue in other parts. Like diffuse inflammation pneumonia attacks in general the most depending portions first, hence the lower lobes are first affected in those who are in the erect position on the invasion of the disease, and the posterior parts of the lung, in those who are in the recumbent position, as in the pneumonia supervening at the latter stages of fever, or in the pneumonia of the dying. Like it, pneumonia commences with œdema and ends in suppuration, which has a tendency to diffuse itself, and seldom or never ends in abscess. Like the diffuse inflammation of the cellular tissue, too, pneumonia is† attended with a symptomatic fever, very analogous to the common continued fever, and which in worn-out subjects is very apt to assume a typhoid type. The yellow tuberculation of the lung, on the other hand, is situated in the air-cells and smaller branches of the *bronchi*, from its having actually been seen in this situation by Carswell, Reynaud, and others, from its granular form, (when examined attentively the grains are seen to hang from branch-like pedicles,) resembling much the disposition of the cauliflower, and, lastly, from its being deposited in the lobular form, which is the case when blood is effused into the air-cells, as in pulmonary apoplexy. It is probably the effect of acute inflammation of their lining membrane. This, from the arguments adduced by Dr Harrison‡ and others of the Dublin school, we have every reason to believe, is of the nature of a serous membrane; hence when inflamed it pours forth the same products as serous membranes, yellow lymph and serum. The latter probably escapes

---

the middle, and in two it extended to all the lobes. On the contrary, of ten cases of pneumonia recorded in the register, in eight it was confined to the lower lobes, in one to the upper and middle, and in one it extended over all the lobes. Hence, I am inclined to believe that most of the cases in which pneumonia is said to have affected the upper lobes were examples of this acute yellow diffused tuberculation.

* Op. cit. p. 46.

† Practice of Physic, by Bright and Addison, Part ii. p. 233.

‡ Dublin Med. Journ. May 1837, p. 233.

with the halitus, and the plastic lymph is alone left behind. In healthy subjects, in whom the disease does not prove fatal in the acute stage, this lymph is most likely either absorbed, or, becoming organized, is gradually converted into a tissue analogous to that in which it is generated, and may give rise to cohesion of the opposite surfaces of the tubes and air-cells, causing their obliteration, as in the cases which, according to Dr Stokes,* occurred to M. Reynaud. In debilitated or scrofulous subjects, on the other hand, in consequence of the debility of the absorbing or assimulatory functions, it is not absorbed, nor does it become organized, but it degenerates into a chronic state, and may be gradually converted into tubercular matter, which acts as a foreign body, and a process is set up for its elimination. In the same manner acute pleurisy in such habits often degenerates into empyema. Chronic inflammation of the same serous lining gives rise, instead of the yellow, to the gray semitransparent matter, just as it does in cases of pleurisies which have been chronic from the commencement. In them it is usually deposited in the form of layers, but it occasionally assumes the form of granulations, which, notwithstanding the opinion of Chomel and Andral, it appears to me, are quite analogous to the gray granulations found in the substance of the lung. The *gelatinous infiltration* of Laennec is also the result of a chronic inflammation of this lining membrane of the air-cells and smaller *bronchi*. It is a rare affection of the lungs in this country. It did not occur in any of the cases. I saw it once covering the pleuræ with a layer of considerable thickness in a case of chronic pleurisy associated with purulent matter.

On the supposition that both kinds of tubercular deposit arise from inflammation, either acute or chronic, of the air-cells and the smaller branches of the *bronchi*, we can account for their so often being the consequence of *bronchitis*, especially when long-continued, it being merely an extension of the inflammatory action from the larger tubes to their smaller branches. We may also account for the deposition first taking place in the upper lobes and in the posterior parts of these lobes, from the *bronchi* being shortest at this part. The inflammation, in spreading along these tubes, here first reaches the small branches and the air-cells. To this may contribute the more frequent occurrence, according to Andral, of *bronchitis* in the upper lobes.

Although the inflammation of the cellular tissue of the lung constituting pneumonia, and that of the air-cells and smaller *bronchi*, giving rise to tubercular deposits, occur generally independent of one another, yet they are not unfrequently conjoined. In the midst of a mass of lung in the suppurative or third stage of pneumonia, small round light yellow bodies are occasionally seen of a soft consistence, rarely hard. These are simple tubercles, having their origin in acute inflammation of single air-cells. They were noticed by Gendrin,* who assigned their true seat, but denied that they were tubercles, from their being soft, yellow, and opaque. He also placed the seat of pneumonia outside the air-cells. I believe them to be of contemporaneous origin with the pneumonia. Pneumonia is more seldom seen associated with the aggregate form of tubercle, (although Laennec † mentions having met with yellow tubercular masses of the size of filberts in the centre of a portion of lung already advanced to the state of purulent infiltration,) and very rarely with the diffused form. I never saw a case of it. The case of a peculiar species of pneumonia described by Dr Stokes, ‡ I believe to be one of the kind. The bunches of granules in the above case, I conceive, were the air-vesicles filled with the tubercular plastic matter, rendered more distinct by the suppuration which had taken place in the cellular texture around them. In cases of common pneumonia advanced to the suppurative stage, such granules are never seen, as the air-cells are empty, and have suffered compression from the surrounding purulent matter.

---

* On Diseases of the Chest, p. 139.

B. EXCAVATIONS.—These were formerly considered, under the name of *vomicæ*, to be essential to the existence of phthisis. It is now allowed, however, that it may prove fatal without them. They were not found in eight of our cases. Three of these were examples of the *phthisie granuleuse* of Bayle, in which the *gray simple tubercle* is the essential lesion; three were examples of the diffused form of the yellow tubercular deposition: and in the remaining two the *diffused gray tuberculation* formed the principal lesion, associated with limited portions of the yellow matter.

Pathologists are not agreed as to the part of the tubercle in which the process of softening commences. Laennec and Louis supposed it always to commence in the centre of each tubercle. Lombard and Carswell indifferently in the centre, and at the circumference. I believe that it differs somewhat in the different kinds of tubercle. In the simple or miliary tubercle it generally commences in the centre, which in most cases remains empty, and into which a quantity of mucus or serum is poured from the corresponding bronchial tube. This has the effect of breaking up the tubercle from the centre to the circumference, and the softened matter escapes into the bronchial tube. The cavities to which they give rise are of small size, not larger than peas, and are sometimes found, like the tubercles, scattered over the lungs, of which Dr Baillie [*] saw cases. I have seen similar cavities scattered over the lung proceeding from the softening of gray simple tubercles, the outer parts of many remaining in their hard state, and inclosing the softened portion. More commonly, however, they are confined to the upper lobes, and from the tubercles having there previously coalesced, they give rise to larger cavities. In the *aggregate* tubercles the softening may commence at any part of their substance, according as it takes place in the several simple tubercles of which they are composed, being effected partly by the central softening of each, and partly by the inclosed cellular tissue pouring out a purulent fluid. In these aggregate tubercles, when they have attained a hard consistence, the softening may also commence at the circumference. The interlobular cellular tissue, which surrounds these tubercles, being compressed and irritated by them, pours out a purulent fluid, which has the effect of breaking down the circumference of the mass, the central portion being at first either left isolated in the centre of the cavity, or adhering by a narrow pedicle to one side of it. When the tubercular matter is entirely softened, the walls of the cavity, which in these tubercles are constituted generally by the interlobular cellular tissue, continue to secrete a purulent fluid. Cavities formed by the softening of those aggregate tubercles never exceed the size of walnuts. Lobular peripneumonies, which differ from common pneumonia in being seated in the air-cells, and the smaller branches of the *bronchi*, in suppurating, also give rise to abscesses, which are limited by the interlobular partitions. As the *diffused* tuberculation is formed by the juxta-position of the aggregate tubercles, so its softening commences in each of these individually, giving rise to separate cavities,[†] which are sometimes dispersed over the whole of a lobe or two lobes, without having coalesced, when the lung may be well said to be riddled by them. They are lined by membranes constituted by the interlobular cellular tissue much compressed. In this the larger vessels of the lungs ramify. The compression[‡] has served to obliterate these, and in this way hemorrhage is prevented when these partitions come to be ruptured. It occasionally happens that these vessels remain pervious, and, the ulcerative process attacking their coats, copious hemorrhage is apt to follow. This was the case in two instances, (99 and 348.) Copious hæmoptysis occurred in both before death. On dissection vessels quite pervious were seen to cross the cavities; (see Plate I.) but in neither could the orifice from which the blood came be discovered. By the breaking of the partitions communications are formed between neighbouring cavities, and thus larger ones are formed, which occur generally at the upper and back part of the superior lobes. These are often crossed by transverse bands, the remains of the unbroken interlobular partitions containing generally obliterated vessels. These large cavities are generally very irregular in their size and shape. I have seen one occupy nearly the whole of a lung. They are seldom lined by a distinct membrane. Their walls are generally constituted by the surrounding condensed lung. A yellowish layer of lymph occasionally partially lines their interior.

---

* Histoire Anatom. des Inflam. Vol. i. p. 313. † Laennec, Op. cit. p. 291.
‡ Op. cit. p. 143.

---

[*] Morbid Anatomy.

[†] It appears to me that the destructive effects on the lung produced by the suppuration of these tubercular deposits is chiefly owing to their being confined to lobules by the interlobular cellular tissue. In pneumonia, on the other hand, the matter is diffused throughout a wide space, and, therefore, has not the same tendency to break up the pulmonary texture.

[‡] The compression of these blood-vessels by the diffused tubercular deposition occasionally gives rise to gangrene of portions of the lung.

With regard to the healing of these cavities, I agree with Dr Carswell* that "pathological anatomy has perhaps never afforded more conclusive evidence in proof of the curability of a disease than it has in that of tubercular phthisis." I differ, however, from him in his description of this curious process. I believe that tubercular matter is never converted at once into cretaceous matter, as he supposes sometimes to happen, without having previously been softened, been eliminated, and given rise to excavations. Cretaceous tubercles are always enveloped in a firm fibrous cyst, to one part of the circumference of which bronchial tubes may be traced, and a depression in the corresponding surface of the lung is always found. This is never the case with common tubercles. These cretaceous tubercles appear to me to be formed in the following manner. The walls of the excavation about to heal up, consisting of dense fibrous matter, gradually contract, along with the orifices of the bronchial tubes entering the excavation, with the walls of which they are continuous. This contraction having proceeded a certain way, the bronchial tubes become obliterated probably by thickening of their walls, and adhesion of their membranes. The walls of the cavity, which has now assumed a round or oval form, continue to secrete a purulent fluid. This, unable to escape, remains in the cavity; its more liquid parts become absorbed, to which the pressure of the still contracting walls contribute. It passes successively through various degrees of consistence, from that of thick cream to that of hard dry putty. It now constitutes the cretaceous tubercle, surrounded by a firm enveloping cyst, at one side of which the obliterated bronchial tubes terminate. The obliteration occasionally extends for some way along the tubes, more commonly it takes place suddenly at the part where the bronchial tube reaches the enveloping cyst;

---

* Cyclopædia of Med. Vol. iv. p. 267.

and the rest of its canal remains pervious, or has become dilated. The corresponding depression of the surface of the lung is caused by the falling in of the subjacent pulmonary tissue, which has been forced to follow the contracting cavity. These cretaceous tubercles [*] undergo still farther changes in being converted into hard calcareous matter. I have met with one mass in the lungs of the size of a nut, firmly enveloped in a fibrous cyst, in which obliterated bronchial tubes terminated. In general these calcareous masses do not exceed the size of peas; they often retire from their enveloping cysts, and are occasionally seen loose in the cavities,[†] from which they may afterwards escape, and be found in the expectoration. I believe the above to be the general way in which the healing of tubercular cavities takes place. I have never met with cicatrices, as formed by the adhesion of opposite surfaces of a cavity, or empty cavities lined by a serous membrane, and secreting a serous fluid, described by Laennec and others.

C. UNTUBERCULATED PULMONARY TISSUE.—It sometimes retained its natural character; more commonly it was altered. In some cases the air-cells had become dilated, or had acquired a state of hypertrophy, by which they were enabled to perform a kind of supplementary respiration, and thus to make up in some measure for the portion of lung rendered unfit to carry on this function. The lung had acquired that state in some of those cases where a copious deposit of miliary tubercles had taken place over a considerable extent of one or both lungs, rendering percussion nugatory in their detection. In other cases, where the upper lobes had become condensed, the lower lobes exhibited this condition; and, lastly, it was often well marked in the sound lung, when the other had been rendered unfit for respiration. I have seen the sound lung acquire this condition to such a degree, that it pushed the anterior *mediastinum* to the opposite side, and thus encroached on the opposite lung. It is a very analogous state to emphysema, and is often mistaken for it. This latter also is sometimes found associated with tubercular deposits, especially of the chronic kind; indeed, two of the most exquisite cases of emphysema, attended with large bullæ, that I have seen, occurred under these circumstances. The tissue of the lung unoccupied by the tubercular matter was occasionally much infiltrated with serum. It occurred in eight of the cases; and in several of these between the miliary tubercles. When associated with much reddening and softening of the tissue, it might be said to constitute the first stage of pneumonia. The red hepatization occurred in several of the cases, especially those in which the yellow acute tuberculation took place. In these it generally assumed a very granular appearance. When it occupied the pulmonary tissue, between the miliary tubercles, or had attacked the lower lobes shortly before death, the lung assumed a very tough consistence, was very smooth on the cut surface, and the appearance seemed to be produced by adhesion of the opposite surfaces of the air-cells, without the intervention of any other substance, and was very analogous to what has been called *carnification* of the lung. This, I presume, is the non-granular form of the red hepatization described by Williams.

---

[*] Since writing the above, I have read the excellent memoir of M. Reynaud on Obliteration of the *Bronchi*, in the fourth volume of the Memoirs de l'Academie de Medecine. In this he treats at considerale length of those cretaceous tubercles, and takes a similar view of their formation to that in the text. He says he has observed them to contain within their substance bronchial tubes, and portions of formerly organized tissue. I have never observed this; but when they do occur, they appear to me to be the remains of these bands containing bronchial tubes and obliterated vessels, which are often found crossing from one wall of cavities to the other, and which have been included within the mass of the cretaceous tubercle.—When they exist they will aid materially the contraction of the cavity, by drawing the opposite walls together.

[†] Vide Dr Hope's Plates, fig. 24, 27, 29.

D. PLEURÆ.—*a. Adhesions* of opposite surfaces of the pleuræ existed in all the cases, generally on both sides, always in one or other of them. Of those cases where they were confined to one lung, the right side was more frequently affected than the left, which differs from the experience of M. Louis,* as he found them more common on the left side than on the right. Their extent was always proportionate to the tubercular state of the lungs, and their strength and thickness to the progress of the excavations. They were most extensive and intimate at the upper and back part of the lungs. The medium of union was in some a layer, varying in thickness from a few lines to one-fourth of an inch, of a gray semitransparent matter, of various shades, much resembling the matter of gray tubercle, and like it occasionally assuming the granular form. In other cases a yellow layer, of variable consistence, in all respects analogous to the yellow tubercular matter, formed the bond of union. Occasionally these two substances were associated. In a few rare instances the opposite pleuræ adhered without the intervention of any other substance. In 16 of the cases, evidences of *acute pleurisy* were found: in 4 of these a yellow lymph was alone effused, slightly glueing together the opposite surfaces of the pleuræ. In all the others it was conjoined with the effusion of serum. In 6 it was the result of perforation of the pleuræ, in which case air was most generally effused at the same time. In 2 the matter effused was more like the fluid of empyema, approaching the nature of pus. In 9 of the cases serum was effused into the pleural cavities, in one of which it was bloody. In one (209) something like gangrene of the pleuræ had taken place.

---

* Op. cit. p. 39.

b. Perforation of the pleuræ occurred in six of the cases, in (256, 261, 262, 359, 361, and 403;) three were on the right side, and three on the left. Louis, on the contrary, found them more common on the left side, in the proportion of 7 to 1. They were in all situated either in the lower part of the upper lobe, or in the upper part of the one below it, generally more anteriorly than posteriorly. Most of them seemed to arise from the thin walls of a cavity, which had approached the surface without previous adhesion, giving way. In one or two cases they were caused by the adhesions themselves breaking up these thin parietes, in the manner ingeniously pointed out by Dr Carswell.* The shape of the orifice was in some round or oval, in others irregular and ragged. In most of the cases the perforation gave rise to acute inflammation of pleuræ, (See Plate II.) marked by sudden pain and dyspnœa: In one death took place in a few hours, in another after two days. In others, as in No. (256,) the perforation had existed for some time, and the accompanying pleurisy had degenerated into a chronic state. In this case a large ulcerated surface existed on the anterior part of the upper lobe of the right lung, in the centre of which was an opening leading to deeper seated cavities. The thin external walls of the cavity in which perforation had taken place had been removed by ulceration, exposing the internal walls, which then formed the surface of the ulcer. Through the central orifice air was heard to pass freely during life, giving rise to loud amphoric respiration. In case (359,) both orifices seem to have become plugged up, preventing the air from longer entering the cavity of the pleuræ. The case then became one of common empyema. This happened still more remarkably in another case, which, having been put down in the register under the name of chronic pleurisy, is not inserted among the cases in the table. An account of it was published in this Journal by Dr Henderson,† who gave a perfectly correct diagnosis of the case before death. Obliteration of the orifice seemed to be effected partly by its valvular nature,‡ which the pressure of the accumulating fluid would have the effect of closing, and partly also by the thick pultaceous matter that had been deposited around it from the pleuritic fluid. An exactly similar case is given in the first volume of the Liverpool Medical Journal. This conversion of pneumothorax, with effusion into simple empyema, by the shutting up of the fistulous orifice, is an effort of nature to cure the disease, which it is to be feared is too often prevented by the unnecessary interference of the surgeon, for the operation of paracentesis in cases of empyema of this nature, I conceive, always must hurry the fatal termination, by removing as it were the pressure from the valve, and thus readmitting the air through the orifice. Death in both the cases soon followed the operation.

---

* Dr Clarke on Consumption, p. 154. † Ed. Med. Surg. Journ. Vol. xliii. p. 346.

‡ The valvular structure of the orifice is well described by Dr Houghton in the Cyclopædia of Practical Medicine, Art. Pneumothorax.

E. BRONCHI.—These were more or less inflamed in nearly all the cases; indeed, so commonly were they affected, that little notice is taken of it in the account of the dissections, which will account for the frequent blanks in the column of the table headed bronchitis. Few cases of phthisis occur which do not commence with bronchitis. I have endeavoured to account why the one so frequently should follow the other, and why therefore the tubercular matter should be first deposited in the upper and back parts of the lungs. The bronchi entering excavations were often much reddened and inflamed, probably from the irritation of the contents of the cavities passing over them, as remarked by M. Louis.* In addition to inflammatory redness, the bronchial membrane was occasionally found thickened, but rarely ulcerated. When this did occur, as in one or two of the cases, their situation was about the bifurcation of the trachea. In one or two cases the bronchi were dilated.

F. RELATIVE AFFECTION OF THE TWO LUNGS—In 25 of the 100 cases both lungs were equally affected. In 38 the right lung was most affected: In 37 the left. From these results it would appear that the two lungs were nearly equally affected. The same conclusion is confirmed by the cases of perforation, 3 of which were on the right side, and 3 on the left. If any difference existed in the frequency of the affection of the two lungs, it was rather in favour of the right, as of 5 cases in which one lung only was affected, four were on the right, and only one on the left. Louis,† in his cases found the left lung much more frequently affected than the right; and Laennec,‡ on the other hand, found the right the more frequently affected. So that the result of our cases holds a sort of middle course between the experience of these two pathologists.

2. HEART.—Out of 66 cases in which the state of the heart was examined, it was healthy in 40, or in about two-thirds. This is very different from the experience of Andral §, who found this organ healthy in one-third and diseased in two-thirds. In 4 the left ventricle was hypertrophied, in 1 the right, and 5 the hypertrophy extended, as it most commonly does, to both ventricles. In most of them it was evidently caused by disease in the aortic, or most generally in the mitral valves. The state of the lungs had little effect in producing the hypertrophy, otherwise the right ventricle would have been more frequently affected than the left. Louis‖ also found the right ventricle less seldom affected than the

---

* Op. cit. p. 37. † Ibid. p. 8. ‡ Op. citat. p. 282.
§ Clin. Med. Vol. iii. p. 271. ‖ Ibid. p. 53.

left, as it occurred in one case only out of 112, whereas the left was affected in 6 cases. The mitral valves were diseased in 4, the aortic in 1; giving rise in all to hypertrophy of one or both cavities. The left ventricle was dilated in its cavities, and thinned in its parietes in two cases. The *foramen ovale* was open in 3 cases. Adhesions of the heart to the pericardium existed in 1 case. Serum was effused to a considerable extent within the pericardium in 1 case. General dropsy occurred in 2 only of the cases in which the heart was found diseased, and in 3 of those which had dropsical symptoms the heart was found perfectly healthy. These facts seem to show that general dropsy is not always owing, as some suppose, to disease of the heart. In some cases this is undoubtedly its origin. In other cases it may be owing to the impeded circulation through the lungs, to the altered state of the blood, or to the general debility of the system.

III.—NATURE AND EXTENT OF THE AFFECTIONS OF THE ABDOMINAL ORGANS.

1. STOMACH.—Of 36 cases in which this organ was examined it was found healthy in 19, or nearly in one-half. In one case it was very much contracted: in 7 cases it was, on the contrary, much distended, so as in some to fill nearly the whole cavity of the abdomen, concealing the other viscera, and extending downwards as far as the brim of the pelvis. Its position also in such cases was generally altered. Instead of being situated across, it lay lengthwise from above downwards, the pyloric end being dragged down into the right iliac region. This great distension of the stomach is certainly peculiar to phthisis, as M. Louis * remarked, being seldom or never observed in other diseases. It is generally accompanied with much paleness of the whole organ, with thinning of the whole coats sometimes to an extreme degree, and occasionally with softening of all of them. Louis ascribed it to the effect of the concussion of the cough on the coats of the stomach. This may be the cause of it in some cases. But as it is not found in cases of other pectoral affections accompanied with a cough as severe and as long continued as in phthisis, I would rather ascribe its origin to debility of the coats of the stomach attending the dyspepsia that so often accompanies phthisis, from which they yield to the accumulation of air within the cavity of the organ. The mucous membrane was softened in five of the cases, in some extending over the whole internal surface, most generally confined to the portion lining the cardiac extremity. The characters of this softening corresponded accurately to the excellent description given of them by M. Louis. It was known at once by the large dark vessels which traversed the softened portion. † The cause of their increased size appears to me to be

---

* Op. cit. p. 62.

† Vide Hope's Plates, Fig. 132.

owing not so much to their being more distended by blood, as to that blood which they contain transuding through their coats, and tinging the softened mucous membrane for some distance on each side of their tract. The blood, too, acquires a very dark colour, probably from the gases of the stomach acting more readily on it through the softened membrane. This increased imbibing power consequent on the softening of the membrane is shown also by its being tinged yellow from the bile, while the unsoftened portions retain their natural colour. I have remarked this softening more frequently in those who have died of phthisis than of other diseases. I believe it is often the cause of the severe dyspeptic symptoms which often attend that disease. In some cases it is no doubt a *post mortem* change. The mucous membrane was thickened and mammillated in one case; it was extensively reddened in two cases. Ulcerations were found in two; in one case in the pyloric end, in the other in the small curvature.

2. The Small Intestines were examined in 66 cases, and were found healthy in 20. In 13 the solitary and agminated glands of the mucous membrane lining the lower portion of the ileum were found enlarged. Connected with these glands, small hard tumours, generally of a tubercular nature, of a gray or yellow colour, as they happened to consist of the gray or yellow tubercular matter, were often found. When in connection with the solitary glands, the tumours were isolated, but when the agminated glands were invaded by them they occurred in groups. The ulcers often seemed to originate in the subsequent softening and ulceration of these tubercles. Ulcerations were found in 30 of the cases, in one-half nearly. Louis[*] found them in a much larger proportion in his cases, in 78 out of 112. I have nothing to add to the minute description given of them by Louis and Andral.

3. The Large Intestines were examined in 55 of the cases. They were found ulcerated in 38, a proportion considerably greater than the small intestines. M. Louis,[‡] on the contrary, found the small intestines more frequently ulcerated than the large. They generally occupied a greater extent of the membrane than in the small intestines, and extended to a greater depth. In one case (296) the ulceration had proceeded through the whole coats, giving rise to acute fatal peritonitis. Tubercular matter was seldom seen in the mucous membrane of the large intestines.

In case (560,) in which dysenteric symptoms took place towards the close of the disease, the mucous membrane of the whole of large intestines, and the lower part of the small intestines, was found reddened and roughened from the deposition of recent lymph on its surface.

4. The Mesenteric Glands were found enlarged in 8 of the

---

[*] Op. cit. p. 84.

[†] Op. cit. p. 101.

cases. What relation these bear to those in which they were healthy is not known, as the number of cases in which they were examined is not mentioned. They were much less seldom found diseased than might have been supposed, from the frequent occurrence of ulcerations. The substance of the glands when enlarged was generally red, softened, and contained numerous yellow points which, gradually coalescing, the whole gland was converted into tubercular matter. This in some went rapidly on to suppuration, in others slowly. The pus was collected in an abscess, the walls of which were formed by the thickened enveloping capsule of the gland. The contained matter by absorption of its liquid parts seemed sometimes to be converted into a matter like putty, which afterwards became hard and calcareous. They were reduced to this latter state in one of the cases. This mode of cure in these glands is exactly similar to the healing up of tubercular cavities. Three of the cases in which these glands were found affected occurred in children, in whom they produced symptoms of *tabes mesenterica*, masking in a great measure the phthisical. In adults they produced no symptoms. A lardaceous tumour existed in the folds of the mesentery in one case.

5. The Liver was very commonly diseased in the cases. Out of 65 cases in which it was examined it was found healthy in 14 only. In 23 it exhibited different forms of the early stages of *cirrhosis*, in which the organ becomes enlarged, hardened, and variegated in colour like a section of the nutmeg, with dark red spots scattered over a light yellow ground. The cellular tissue was occasionally thickened and indurated, as well as the peritoneal covering, which had contracted adhesion in some with the lower surface of the diaphragm. In none of the cases had it attained the advanced stage of that disease, when it becomes lobulated and diminished in size. In many cases this disease of the liver was no doubt owing to obstructed circulation through, and diminished function of, the lungs; but I would ascribe its origin in most of the cases to the abuse of spirituous liquors, to which many of the individuals in whom it was found were addicted; hence we may account for its more frequent occurrence among men than among women. Neither Louis nor Andral take notice of such an affection of the liver in their cases. They mention the *fatty* state of the liver as having occurred in one-third of their cases. It occurred in a smaller proportion in our cases, in 10 out of 65. Its characters corresponded very exactly with the description of it given by M. Louis.* The colour was a light reddish-yellow, or salmon colour, dotted over with brownish-red irregular spots; its consistence was soft, and the organ had a very unctuous feel. It occurred more fre-

---

* Louis, op. citat, p. 115. Andral, op. cit. p. 346.

quently in women than men, in the proportion of 9 to 1. Nothing is known of the origin of this particular change in the liver, nor in what it consists. In some of the cases it was combined with adhesions of the liver to the lower surface of the diaphragm, as if inflammation had some share in its production. Many of the individuals in whom it occurred were addicted to the abuse of intoxicating liquors. Another change of the liver, which I would denominate the *waxy liver*, has not been noticed by any author, except by Professor Mayo, under the name of *Steatosis*. The liver in this condition acquires an increased size, weighing from six up to fourteen pounds, in which last case it filled the whole abdomen; its capsule is generally thick and opaque; its internal substance dense, but friable, homogeneous, of a brownish yellow colour, much resembling bees-wax, with a strong resinous lustre, feels soapy to the touch, greases the knife with which it is cut, and communicates a greasy stain to paper by the aid of heat. In some of its characters it bears considerable analogy to the fatty degeneration, but it differs from it in the liver acquiring a larger size, in its colour being of a much darker hue, and perfectly homogeneous. It is probably an advanced stage of the same affection, being an extension of the matter composing the brown spots over the whole substance of the organ. It occurred in five cases, four of which were women, and one man. Its intimate nature and cause are alike unknown. The liver was enlarged in three cases, without being otherwise materially diseased. In three its colour was observed to be paler than usual, probably partaking of the general anæmia of the system. It contained tubercles in three.

6. The SPLEEN was thickened and opaque in its capsule in one case. In one case a piece of bone the size and shape of the patella was imbedded in its substance. It contained tubercles in its substance in two cases; in one of these they consisted both of the yellow and gray kind.

7. The KIDNEYS.—These organs were in general found healthy. In two cases they were paler than usual, in one of which the cortical portion was very dense. In four the structure of the organ had undergone the granular degeneration first described by Dr Bright, so that this particular change in the kidney is not incompatible with the tubercular diathesis, as its discoverer supposed. Tubercles were not found in the kidneys in any of the cases.

8. The PERITONEUM.—Serum was effused into the cavity of the peritoneum in three of the cases, in two of which it was associated with dropsical effusion in other parts of the body. Lymph and serum, the result of acute inflammation of the membrane, were found in this cavity in two; in the one it was general, and was the result of perforating ulcer of the colon; in the other it was more partial, being confined to the right iliac region.

The effects of a still more partial peritonitis were observed in the portions of the membrane opposite to the deep ulcerations of the ileum, by which their presence was often ascertained before opening the gut. In these portions the membrane loses its smooth glistening appearance, becomes rough and unequal, from being covered with small granules, some gray and semitransparent, others yellow and opaque, resembling the two kinds of simple or miliary tubercle so often mentioned. These were generally incircled with a red zone, composed of minutely injected vessels, showing the diseased appearance to consist in inflammation. The effect was evidently to thicken the membrane, so as to prevent its rupture, or to cause adhesion of two opposite folds of ileum, so that if rupture did take place the contents might not escape into the general cavity of the abdomen.

Art. II.—*Report of Surgical Cases, treated in the Glasgow Royal Infirmary, during the years* 1836–7. By William Davidson, M. D., Surgeon to the Glasgow Royal Infirmary, and Lecturer on Materia Medica in the Medical School, Portland Street.

Fracture of the Ossa Innominata.—Patrick Twiney, aged 25, a robust collier. While this man was descending the shaft of a coal-pit, in the lowest of three buckets, each containing several men, the weight proved too great for the power of the engine, and the bucket in which he stood was hurried with tremendous velocity to the bottom, a depth of about 200 feet. He was admitted on the following day, viz. 27th September 1836, and on examination both legs were found of equal length, slightly everted, but capable of being brought into apposition without difficulty. He could raise the left lower extremity with considerable ease, but experienced acute pain in the right haunch, when he attempted to bend the right thigh upon the pelvis.

On placing the hand upon the *crista ilii* and rotating the limb, distinct crepitus was felt on each side. On the right side the fractured bone was more moveable than on the opposite side, and the fracture appeared to be more extensive. Rotation or even slight motion of the lower extremities was productive of very intense pain.

The abdomen was tympanitic; the pulse 96, full; the bowels slow; but he passed urine freely. He was bled to thirty ounces on his admission, had a purgative of calomel and jalap, and a broad bandage was applied to the pelvis. The symptoms continuing much the same on the two following days, the pulse being strong and full, he was again bled to the extent of fifty ounces, and had two turpentine *enemata*, which relieved very much the tympanitic swelling of the abdomen.

By this treatment the symptoms were much mitigated, but there were still reasons to fear the extension of inflammation into the abdominal cavity. He was therefore put upon calomel and opium every sixth hour, and had twenty leeches applied to the pelvis. After this he gradually improved, and was dismissed cured on November 11th.

Fracture of the Pelvis; compound comminuted fracture of the Olecranon and fracture of the Radius.—John Murray, aged 36, slater, while repairing the roof of a three-storied house, on the 13th of March 1837, suddenly slipt, while walking along the ridge, and fell into the middle of the street. On his admission about an hour after the accident, he was pulseless, and in a state of complete collapse. He complained of acute pain in the lumbar region and in both haunches, could draw up both legs, and even bend the thighs; but he experienced considerable pain in the attempt. The right leg appeared to be half an inch shorter than the left. The right *os innominatum* was found fractured about an inch and a half behind the superior anterior spine, and the *os pubis* was also fractured close to its spine on the left side. The crepitus in both situations was very distinct. The olecranon process was found comminuted, and immediately above it a small wound was observed over the posterior aspect of the arm; but it did not penetrate deeply, and did not seem to communicate with the broken extremities of the bone. The radius of the same arm was fractured at its carpal extremity in the precise situation of a former fracture of that bone. He complained of considerable pain in the site of the left hip-joint, aggravated by motion. The general health previous to the accident was good, the pulse was 80, and he had slight cough, but he passed urine freely. He got a few ounces of wine, a bandage was applied to the pelvis, and a splint was applied to the arm, and placed in the extended position. He recovered from the state of collapse in a short time; but he complained very much of the pain in the region of the pelvis, and very little of his arm.

The pulse continued rather weak for two days, and laxative enemata were the chief measures had recourse to; but as his pulse was 112, and had become a little firmer, blood was abstracted by cupping from the region of the right *os innominatum* to the extent of eight ounces. The symptoms continued much the same for several days, and he was much annoyed with frequent cough, and stated, that during a paroxysm of coughing he felt the bones of the pelvis rubbing against one another. Two weeks after his admission the elbow became swollen and painful, and the bandages were removed; for they had not been previously much interfered with.

From the wound over the olecranon considerable suppuration took place, and a denuded bony surface could be detected with the probe. He complained, however, of little pain in the region of the pelvis. The pulse was 84, weak, the tongue white and rather dry.

The swelling and suppuration continued for several weeks, accompanied with perspirations, and there was reason to fear that the joint was laid open; but under the use of tonics and careful bandaging, he ultimately did well, and was discharged cured on the 8th of May.

I had an opportunity of seeing him about the beginning of July last, and he then complained chiefly of stiffness in the joint; so that he could not flex it sufficiently in his employment of placing buckets full of lime on his head; but its general motions were pretty well restored, and in the region of the pelvis he felt quite well.

Double fracture of the femur, one of them extending into the knee-joint.—Hamilton, widow, aged 70, of impaired constitution, admitted 15th October 1836, was accidentally knocked down on the previous night, and fell with considerable violence upon the right thigh. The *os femoris* was found to be obliquely fractured in its middle and also above the condyles; the fracture in the latter situation, detaching the inner condyle and extending into the joint. There was some swelling around knee-joint, but little pain except on motion.

The limb was put up with Desault's apparatus; but next day she felt considerable pain in the thigh, which was somewhat swollen; the pulse was 104, and the tongue dry. The position was changed two days after her admission to that of the double inclined plane, (Macintyre's apparatus being employed,) and after that time she experienced more ease; the pulse having fallen to 90, and her tongue becoming moist. She was going on favourably till about the 31st October, when she again complained much of a dragging sensation and acute pain in the knee. The straight position was again employed, and from that period she continued to recover, and was dismissed cured on the 9th January 1837, the limb being perfectly straight.

Desault's apparatus is generally employed in fractures of the thigh-bone in the Glasgow Infirmary, and, as far as my experience goes, is better calculated to preserve the bones in proper apposition, and to maintain the proper length of the limb than the double inclined plane; but in cases where the fracture is complicated with extensive injury of the soft parts, or of the knee-joint, a relaxation of the muscles is of essential benefit in preventing irritation and subsequent inflammatory action. This was the reason for changing the position in this case, which was by no means favourable as to prognosis, considering her age and impaired constitution.

Compound Fracture of the Femur,—removal of a portion of the Bone.—John Paterson, coal-miner, aged 40, of healthy constitution, was admitted on the 18th January 1837. The day before, while repairing the shaft of a coal-pit, he accidentally missed his footing, and fell upon the rock below, a height of about 96 feet, and when taken up was found perfectly insensible. The left thigh-bone was found obliquely fractured and comminuted, at the junction of its middle and inferior thirds. A small opening, scarcely large enough to admit the point of the little-finger, was found on the outer aspect of the thigh, at the seat of fracture, and communicating with the extremities of the broken bone. A good deal of hemorrhage had taken place from the opening before admission. An irregular wound of the scalp, about two inches long, was found extending from the right temporal to the middle of the occipital bone. The limb was put up in the straight position, and the wound of the scalp was dressed with adhesive plaster. The symptoms continued pretty favourable for several days, the pulse being about 96, the tongue moist, and the limb little swelled; but his bowels were tympanitic and obstinately constipated, and they required repeated doses of croton-oil before free evacuations were procured. The bandages were removed on the 25th of January, and about four ounces of fetid dark-coloured purulent matter were discharged from the wound. There was in the lower part of the thigh, and around the knee-joint, considerable swelling, which had an elastic feel. The tongue was brownish, and the pulse 100, and weak. He was ordered nourishing diet, wine, and sulphate of quinine.

The swelling and tension diminished in the course of a few days, and the purulent discharge became more healthy in appearance, while florid-coloured granulations were filling up the wound. The appetite was good, and he slept well; but his pulse was 104, rather small and compressible, and he had occasional perspirations.

On the 22d February, a portion of the upper shaft of the bone was found projecting through the wound, although extension by Desault's apparatus had been constantly kept up. There was considerable discharge of healthy purulent matter; the pulse was 84, and weak; the bowels were open; and the appetite was good.

On the 24th the granulations covering the projecting extremity of the bone were removed with a scalpel, and the bone was divided with a metacarpal saw about an inch from its extremity. Several comminuted fragments, which before had adhered firmly to the shaft of the femur, were now removed with the forceps; very little blood was lost, and the ends of the bone were easily brought into apposition with Desault's splint.

The symptoms continued much the same for several weeks, the pulse varying from 96 to 108, but stronger; and some erysipelatous inflammation made its appearance on the 27th of February, extending from the *trochanter major* to the knee, but which subsided in a day or two. There still seemed to be no attempt at bony union, and it was very difficult, even with the utmost extension, to prevent the projection of the upper end of the bone. On the 12th of April, there was found loose in the wound a portion of bone, about half an inch in length, which seemed to be an exfoliation, and not a portion originally comminuted by the fall.

The bandages were now changed only every six or seven days, the profuse discharge having been allowed for sometime to escape through holes cut in the bandages and splint-cloth. His general health was, however, much improved, his appetite was good, the wound was filled up with granulations and cicatrizing, and there seemed now some attempt at osseous union; while he could allow his thigh to be moved without much pain. On the 9th of May an abscess formed on the upper and outer side of thigh, which was opened, and gave exit to a large quantity of matter. A smaller abscess, situate on the inner side of thigh, immediately over the course of the vessels, was also opened on the following day. After these abscesses were laid open, the discharge from the wound gradually diminished, the wound being very much contracted in size. He was dismissed about the middle of May, being able to walk about with crutches. I saw him in the latter end of July, walking with crutches on the road, as I happened to be passing through the village in which he resides. He told me that he was now pretty strong, and that his general health was much improved. The limb is considerably shorter than the other, and the upper fragment of the bone is felt somewhat projecting.

For a considerable time this case had a most unpromising appearance, the discharge being very profuse, and the constitutional irritation very great; but under the employment of a considerable quantity of wine, quinine, and nourishing diet, aided by a good constitution, bony union at last took place, and there is every probability of its becoming an useful limb.

Compound Fracture of the Elbow-Joint.—John Booze, porter, aged 55, while standing in a cart, on November 7, 1836, was suddenly thrown out of it, upon a quantity of rough stones, in consequence of the horse suddenly starting. The *humerus* was found fractured at the elbow-joint. The outer condyle appeared to be detached, but, owing to the enormous swelling of the soft parts around the joint, it was impossible to ascertain this exactly. There was slight laceration of the integuments over each condyle of the humerus, and on the inside of the joint, a little below the internal condyle, was a small wound extending deeply in the direction of articular cavity. The probe passed apparently into the elbow-joint, but bone could not be distinctly felt. The general health had been previously good. On his admission, the day after the accident, he had a dose of sulphate of magnesia, twelve leeches were applied to the arm, and he had a draught of solution of muriate of morphia at bed-time.

On the following day the swelling and redness had extended upwards and downwards, from the joint to a considerable extent, evidently of an erysipelatous character; and it seemed to be spreading upwards most rapidly. An evaporating lotion was applied to the arm and fore-arm, and nitrate of silver was applied, in the form of a ring, to the arm, as high up as the axilla; the skin being first moistened thoroughly with a hair-brush and water, to the breadth of about an inch, and the caustic then rubbed freely on the parts.

On November 12, the swelling and redness were somewhat abated, and had not passed the caustic line on the arm; but there was still considerable swelling of an œdematous character on the fore-arm. The pulse was 84. The bowels were kept open with sulphate of magnesia; simple dressing was applied to the wound, and the bandage of Scultetus lightly put around the limb.

On the 18th November the swelling was chiefly confined to the elbow-joint, and the probe detected bare bone in the wound; he felt little pain; the pulse was 84; the tongue moist; and the bowels open.

From this time the discharge, which was pretty profuse for two or three days, gradually lessened. Passive motion was commenced in about a month after the accident occurred, and he was discharged cured on the 13th January 1837, being able to move his arm pretty freely, and there was no deformity.

This was a case in which there was some doubt whether or not primary amputation should have been had recourse to. The patient was 55 years of age, and though his general health was reported to be good, his constitution did not seem to be very sound, and there was a compound fracture of the humerus extending into the joint. There was consequently great risk, especially in an hospital, of erysipelatous inflammation, extensive suppuration, and high constitutional irritation. In this case no incisions were practised. I trusted to the repeated application of leeches, evaporating lotions, and the power of the lunar caustic, when applied at the proper point, and so as to produce distinct vesication, in checking the extension of the erysipelatous inflammation.

Compound Fracture of the Elbow-Joint.—Biddy O'Neill, aged 7, on the 16th August, the day of her admission, while attempting to leap from a railway carriage, fell in front of one of the wheels, which passed over her left arm. She in consequence sustained an oblique fracture of the *humerus*, near its distal extremity. The soft parts covering the joint were extensively lacerated, and a considerable portion of the skin was torn away. The wound was dressed with adhesive plaster, and put up loosely in splints. She was going on favourably, the pulse being about 80, the appetite moderate, and her sleep pretty sound, till about the 28th, when the pulse became more rapid, and the swelling and suppuration of the joint being much increased, bare bone was now projecting from the wound, and a probe could be passed into the cavity of the joint. These unfavourable appearances subsided in a few days. The limb was put up with a Scultetus' bandage and a hinge splint, so as to admit of passive motion as soon as possible. A spicula of bone was detached about the middle of September, and she was discharged cured, with considerable stiffness of the joint, but not much deformity, on the 3d of October.

In this case the principal reason for attempting to save the limb was the age of the patient; for had the same extensive injury been produced in the case of Booze, already detailed, his age and constitution would have been an almost insuperable objection.

The only internal treatment she underwent was laxatives, antimonials, and light nourishing diet during the suppurative process.

Compound Fracture of the Fore-Arm and Metacarpus.—Janet Kerr, aged 26, of healthy constitution, was admitted 14th February 1837. On the previous afternoon, while putting the leathern belt round a carding-machine, which was at the time revolving with great rapidity, her left arm was accidentally caught in the loop of a side belt, and before it could be disengaged, the fore-arm and hand were dragged over a pulley. The left fore-arm was found fractured at the junction of its middle and distal thirds, and both bones between that point and the wrist-joint were comminuted. When the hand was pronated, there was on the under aspect of the fore-arm, at the seat of fracture, a small wound about half an inch long, which allowed a probe to come in contact with bone. On the back of the hand there was a lacerated wound, extending completely across the metacarpus, from the thumb to the space between the little and ring-fingers. The tendon of the extensor muscles appeared to have escaped injury; but the metacarpal bone of the ring-finger was fractured at its distal extremity. There was a good deal of hemorrhage from the wound, and a small artery required a ligature. There was on admission considerable swelling and tension of the fore-arm, near the elbow-joint. Twenty-four leeches were applied to the fore-arm, and afterwards an evaporating lotion. Notwithstanding the severity of the accident, her pulse continued slow and regular, and the other functions natural, and, with the exception of antiphlogistic diet at first, and occasional laxatives, she had no internal treatment. The fore-arm was placed on a pillow in the prone position, and no splints were applied. Leeches, at first, afterwards simple dressing, Scultetus' bandage, with an evaporating lotion, and the occasional application of the nitrate of silver, to the wounds, were the external means employed. She was discharged cured on the 15th April, the limb being quite straight, about two months after the occurrence of the accident.

Compound Fracture of the Thumb and Fingers; purulent effusion into the joints.—John Macoll, sawyer, aged 25, of healthy constitution, admitted February 19, 1837. While at work in a saw-mill, on the morning of the previous day, his left hand accidentally came in contact with the revolving circular saw. There was a deep lacerated wound on the palmar aspect of the distal phalanx of the thumb, and the bone was exposed and fractured near its centre. There was also a deep wound on the palmar aspect of the index and middle-fingers, but the bone did not appear to be injured. On the 20th, there was considerable swelling of the hand, extending upwards as far as the middle of the fore-arm. The pulse was 100, soft, and the bowels were open. Incisions were made in the hand and fore-arm, at several places, and in about twelve hours afterwards, eighteen leeches were applied.

On the 22d, the swelling and tension were much diminished; but he had been very delirious during the night; the pulse was 120, very feeble; the tongue white and moist; the pupils were rather dilated, and did not speedily contract on the approach of light; and the belly was slightly tympanitic. A blister was applied to the head; he had six ounces of wine, and two grains of sulphate of quinine twice a day. On the 23d the delirium had increased, and he was seized with violent hiccup. He complained of pain in the right elbow and left knee-joints, which were swollen and slightly red; the pulse was 136, very feeble; but the swelling was not extending, and was not above the elbow-joint. He died at one o'clock P. M.

Sectio cadaveris, February 24.—There was slight serous effusion under the arachnoid, and also in both lateral ventricles. The substance of the brain was healthy. The viscera of the thorax and abdomen presented no morbid appearance.

On examining the injured hand, the last phalanx of the left thumb was found fractured longitudinally, the fracture entering the joint. The wound was not adherent at its edges. The first phalanx of the fore-finger was also fractured, but not so extensively. The metacarpal articulation of the thumb, as also the wrist-joint of the same limb, were filled with purulent matter. The integuments on incision yielded a quantity of serous fluid, but there was no purulent matter in the cellular tissue. The right elbow-joint and left knee-joint were filled with purulent fluid; but no disease could be detected in the venous branches in their vicinity. The left elbow-joint contained no purulent matter, and the veins of the injured arm exhibited no trace of inflammatory action.

This case is an exemplification of those fatal results that occasionally follow injuries and operations; but which, under ordinary circumstances, terminate favourably. It is very difficult to form any satisfactory theory respecting the production of these purulent formations. They are very analogous to the formation of those purulent deposits in the viscera which are the results of *phlebitis*, and we would very naturally be inclined to expect their co-existence with inflammation of the veins; but we believe that pathological investigations have not hitherto proved this to be invariably the case.

Separation of the arm by machinery near the shoulder-joint; three ribs and clavicle fractured.—Amputation at the shoulder-joint.—John Dinning, labourer, aged 34. On the morning of the 21st November 1836, while attempting to disengage a sheet from its attachment to an iron shaft, kept in motion by machinery, his left hand was suddenly caught in one of its folds, and rapidly dragged round the shaft; the arm being broken and lacerated in its course, and finally detached from the body, near the junction of the middle and the upper third of humerus. He also stated that his body was dragged round the shaft, and that it passed between it and the floor, a space not exceeding nine inches in depth.

On admission, about an hour after the accident, the broken extremity of the humerus was found projecting about half an inch from the wound, and the soft parts in its vicinity were much lacerated. On the inner side of the stump the integuments were bruised and lacerated as high up as the middle of the axilla, but those on the outer and posterior aspect of shoulder were uninjured. There was no hemorrhage from the stump after admission, and little blood had been lost previously. When brought to the hospital, his pulse was imperceptible at the wrist, the surface of the body and extremities were cold, he had several fits of shivering, and was evidently in a state of complete collapse. Wine and brandy were freely given, in order to promote reaction, and hot applications were made to his extremities. A consultation was held at twelve o'clock noon; but, on account of the very slight reaction which had taken place, it was agreed to defer the operation.

At two o'clock P. M. the patient's warmth had been restored, and his strength had rallied considerably. Amputation at the shoulder-joint was resolved upon, and the operation was performed by transfixing the deltoid, and cutting downwards and outwards, in order to procure a single flap from the sound integuments, that were uninjured on the outer aspect of the shoulder. The knife was then passed into the joint, and carried downwards, in order to divide any portion of muscle or integuments that remained undivided in the wound. The artery was compressed above the clavicle. Little blood was lost during the operation, and only three vessels required ligature.

22d. Considerable oozing of blood took place about six o'clock last night, and on examining the parts, blood was found issuing from several small vessels, which were secured. The pulse was 112, of moderate strength; the heat of the skin natural; the tongue white and moist; the bowels open, and he passed urine freely. He had a draught at bed-time of solution of muriate of morphia and antimonial wine.

23d. No swelling of stump; the pulse was 112, weaker; the tongue white, and the heat of skin natural.

25th. The straps were removed from the stump, and a small quantity of tolerably healthy-conditioned purulent matter was discharged. The pulse was 112, weak; had been much annoyed with hiccup and flatulency; the right arm between the shoulder and elbow on its inner side was much swollen and inflamed, and he had been somewhat relieved by the application of six leeches. The tongue was white. The bowels were opened by an enema. He was ordered beef-tea, creosote in the dose of a drop every two or three hours, a sinapism to the epigastrium, and the enema to be repeated in the evening.

26th. Hiccup became more violent during the night, and was followed by vomiting; no delirium; the pulse was very feeble; and he died at seven o'clock A. M.

Sectio Cadaveris.—Nothing unusual was observed in the brain or its membranes, with the exception of a slight increase of the quantity of serous fluid in the ventricles.

On removing the sternum, the cellular tissue occupying the anterior *mediastinum* was found slightly infiltrated with blood; but the *pericardium* and heart were entire. On removing the right lung, the fourth, fifth, and sixth ribs were found fractured near their centre, and the sharp extremity of the lower fragment of the fifth projected through the costal *pleura* into the right thoracic cavity. The *pleura pulmonalis* was not injured, and the right lung presented no morbid appearance. Several ounces of bloody fluid were found in the right pleural cavity, but there was no vestige of effused lymph on either *pleura*.

The stump being opened up, the surfaces of the wound were covered with a thin layer of purulent matter. The integuments as high up as the neck were much bruised, and the cellular texture and muscles were infiltrated with bloody and purulent mat-

ter. The left clavicle was fractured obliquely, about an inch from the acromial end. The abdominal viscera were healthy.

In this case scarcely any other result than a fatal termination could have taken place, when we take into account the excessive shock which the body sustained, by the tearing off of an extremity, the trunk of the body passing through a space of nine inches, the fracture of three ribs and clavicle, together with the shock of the operation. At the same time, though the chances of recovery were extremely small, it would have been wrong, after reaction was established, to have left the injured parts in their lacerated state, and consequently likely to occasion more danger from hemorrhage or sloughing, than what would be produced by the shock of an operation.

Fracture and depression of the Cranium, Hernia Cerebri.—Donald M'Cuaig, aged 26, farm-servant, healthy, was admitted on the 1st of August 1836. This man stated that, on the previous morning, while passing near some fruit trees on his master's farm, several stones were thrown at him by two men, who were concealed either among the trees, or in the adjoining field; that he was struck by one of the stones on the right side of his head, and was stunned by the violence of the blow, falling down immediately in a state of momentary insensibility. On regaining his consciousness, he was able to walk home, suffering only from the pain of the wound, which had been inflicted by the stone. In the evening he was bled from the arm to the extent of twenty ounces.

On admission to-day at two o'clock, the patient appeared perfectly sensible, and presented no symptoms of injury of the brain. He complained solely of the right side of the head, where was found an irregular wound of the scalp, extending from the right parietal protuberance, obliquely downwards and forwards, for upwards of an inch. Upon examining the wound the skull was found fractured, and a portion of bone about the size of a shilling was comminuted and depressed for nearly a quarter of an inch below the surrounding part. The pupils were natural; the pulse was about 80, and of moderate strength; he could walk about; answered questions correctly; and exhibited no indications of diminished power of body or mind.

Agreeably to the decision of a consultation, the wound of the scalp was enlarged by a crucial incision, and several depressed fragments of bone were removed by the forceps and elevator. The *dura mater* was apparently uninjured, and little hemorrhage occurred during the operation. The edges of the wound were brought together with adhesive plaster. Three hours after the operation, he was bled to thirty ounces, and bladders of pounded ice were applied to the head. He had also ten grains of calomel, with twenty grains of jalap; and two grains of calomel were given every four hours.

August 2d, Several of the straps were removed from the wound, and a little bloody serum was discharged. No swelling was felt or pain complained of in that situation; but he felt some pain in the posterior part of the head, and had slight giddiness, but no delirium. The tongue was rather dry, and white upon the edges; the pulse 96, full; and the bowels had been freely opened.

The two grains of calomel every fourth hour, and the pounded ice applied to the head were continued.

August 3d, Early this morning he was seized with rather severe pain in the posterior part of the head, for which he was bled to the extent of sixteen ounces; and the blood was slightly buffy. At 2 o'clock P. M. he still complained of some pain in the posterior part of head and wound, which discharged a reddish-coloured serum; pulse 88, neither full nor strong; vision natural; tongue white and moist; and he had no delirium.

The treatment was continued.

August 4th. Less pain of head to-day; wound suppurating; slept tolerably well last night; less giddiness; pulse 84; tongue moist, and not so much furred; four stools since yesterday.

The ice applied to the head, and the calomel in small doses were continued.

August 5th, Complained of very considerable pain of head last night, and slept little; wound suppurating, and cavity apparently filling up with granulations; no delirium; eye natural; the pulse 76, rather small; the bowels have been rather severely purged.

The calomel was stopped, and an anodyne enema was directed to be administered if the diarrhœa continued.

August 6th, The pain of head was less severe; no giddiness; no delirium; the pulse was 80, of moderate strength; the tongue clean; and the bowels open.

The anodyne enema was directed to be repeated if requisite.

August 7th, He was bled to twenty ounces from the arm, the pain of the head having increased. The blood was not buffy; a little bleeding has taken place this morning from the wound, which is sloughy in appearance. There is little headach; he slept better last night; the tongue is clean; the bowels twice opened since visit; pulse 84, rather weak.

August 10th, The pain of head is much diminished; slept little; no delirium; tongue moist and clean; pulse 84, of moderate strength; four stools since yesterday

Twelve leeches were directed to be applied to the temples; and a drachm of mercurial ointment was ordered to be rubbed on the inside of the thighs every morning and evening.

August 12th, Wound not so sloughy, and granulating in some points; the pulse is 76, of moderate strength; four stools, otherwise the same.

August 14th, Considerable headach last night, the pain being chiefly confined to the neighbourhood of the wound; but he was relieved by the application of twelve leeches. The wound is granulating at two external points, but sloughing in the direction of *dura mater*. There is no delirium; the mouth is slightly mercurialized; the bowels open. The mercurial inunction was continued; and also the ice to the head.

August 15th, Still considerable suppuration, and wound still sloughy; considerable pain of forehead, and also of wound; pulse 68; tongue white at margins, and rather dry; three evacuations since yesterday. The mouth rather more mercurialized. Twelve leeches were applied to the forehead, and the mercurial friction was continued.

August 17th, Wound still suppurating; complained of general debility, but had less headach; the tongue brown in centre, but white towards margins; the pulse 56, moderate; the bowels were opened once since yesterday; some tendency to vomit, and was slightly troubled with hiccup; appetite diminished. A blister was applied to the nape of the neck; an ounce of castor-oil was given; and the mercurial friction was continued.

August 18th, Wound still sloughy towards the *dura mater*; complained of pain of head, and was very restless last night; tongue white and furred; complained of considerable weakness; pulse 60, rather weak; bowels rather loose. The blister to the nape of the neck was repeated; an anodyne enema was administered; and two ounces of wine were given.

August 21st, Wound still suppurating and sloughy; did not complain of any particular part of head; eyes natural; no delirium; appeared to be more drowsy than formerly, and to be affected with paralysis of left side; had difficulty in making water; but there seemed to be no accumulation of urine in bladder; the tongue is moist and covered with a thick brownish fur; the pulse 60; the skin cool; the bowels opened twice since visit.

August 23d, Wound not suppurating so much, and rather contracting; complained less of debility, and had no pain of head except at wound; paralysis of left arm and leg rather less; pulse 64, not so weak; tongue rather dry, red in centre, white at edges. Passed urine more freely. The wine at the rate of four ounces daily was continued.

August 27th, The wound discharges a considerable quantity of purulent matter from its posterior part; the granulations are florid, and those arising from the *dura mater* very prominent; no headach; vision good; pulse 72, moderate; paralysis of upper and lower extremities diminishing. The wine was continued.

August 29th, Less purulent discharge; granulations still increasing; slight frontal headach; tongue red, dry in centre, but moist at the edges; bowels open; sleeps better; pulse 76, moderate; paralysis of arm and leg much less. Ten leeches were applied to the forehead; and the wine was continued.

August 31st, Discharge of purulent matter continued, although in less quantity; fungus from *dura mater* still increasing; paralysis of left arm and leg rather increased. He complained of severe pulsating pain in head, especially in the right side; bowels open; passed urine freely; tongue still red, dry in centre, but moist at edges. The wine was reduced to two ounces daily, and a blister was applied to the nape of the neck.

September 2d, The fungus had increased rapidly within the last two days. He complained of very considerable pain of head, particularly on right side; slept little; no delirium; no dilatation of pupils; tongue white in centre, and dry; pulse 60, rather feeble; bowels open.

September 3d, The fungus was to-day removed with a scalpel, on a line with the integuments, and there was some hemorrhage from a small arterial vessel, which was restrained by a compress of lint and straps. The fungus seemed to consist of cerebral matter. The wine was continued at the rate of four ounces daily.

September 4th, Fungus had very much increased since yesterday, and the upper portion was in a suppurating decomposing state; the pulse was 80, of moderate strength; tongue brownish-white, and rather dry.

September 7th, The exterior of the fungous tumour was covered with a dark-coloured crust, and sloughing is going on, with increase of suppuration. He complained of little pain of head, and the countenance was more natural; the pulse was 64, soft; not so weak; the tongue moist; the sleep little; the paralysis was the same. A solution of chloride of lime was applied to the wound.

September 11th, A portion of bone of a semicircular form was detached from the surface of the wound, which is still suppurating, and in a sloughy state. The pulse is 84, moderate; the tongue clean, not dry; otherwise the same.

September 15th, The fungus had increased very considerably in size since last report, and had not been suppurating so much. To-day the fungus was sliced off on a level with the scalp, and there was considerable arterial hemorrhage from two vessels. The parts which have been removed have distinctly the structure of brain. A semicircular exfoliation of bone was this day also detached. The pulse is 96, rather weak; the bowels open; the appetite good; no delirium. The wine was continued; and an anodyne enema was directed to be administered if requisite.

September 18th, Considerable suppuration around the fungus, which was increased greatly in size since it was last removed. It was now projecting more than half an inch above the surface of the scalp. The pulse was 88, very compressible; the tongue clean and moist; no delirium; slept well; paralysis the same.

September 19th, Last night about eleven o'clock, slight hemorrhage took place from fungus, which had greatly increased in size since the visit. The bleeding was easily suppressed. This morning a state of stupor supervened; the pupil of the right eye became enormously dilated, and debility gradually increased. Died at a quarter to ten o'clock A. M.

Sectio cadaveris 28 hours after death.—*Head.* The external wound was upwards of an inch in diameter, its edges were indurated, and a putrid portion of the cerebral fungus protruded from the opening. On removing the calvarium, the aperture in the skull at the seat of injury was found to be of a circular form, and about the size of a half-crown piece. At its posterior margin a thin semicircular lamina of the internal table was loose, and nearly detached from its connections.

An opening was next observed in the *dura mater*, corresponding in situation and extent with the cranial aperture, but unconnected to the bone by adhesions. Its edges were thickened, soft, and sloughy; the surrounding portion of membrane being somewhat discoloured.

On reflecting the *dura mater*, the surface of the cerebral convolutions were found more vascular than natural, and the middle lobe of the right hemisphere of the brain was deficient in substance, and in a state of disorganization. It was of a very soft pulpy consistence, and of a deep red colour, except at the immediate seat of the fungous protrusion, where the parts were of a greenish purple hue. On making a transverse incision through the right hemisphere, on a level with the *corpus callosum*, the disorganization of the cerebral substance was observed to extend throughout the whole of the middle, and the greater part of the anterior and posterior lobes. The *corpus callosum* was also completely involved in the disease, and the various parts situated in the floor of the right lateral ventricle were converted into the same pultaceous reddish substance as the rest of the hemisphere. A small quantity of limpid serosity was contained in each lateral ventricle, and about half an ounce of the same fluid was seen to issue from the vertebral canal on separating the *medulla oblongata* from the spinal chord.

The *tuber annulare* and *medulla oblongata* were of a firmer consistence than usual, and the membranes covering them were thickened and opaque. The *cerebellum* and the left hemisphere of the brain, comprising the left lateral ventricle and its contents, exhibited no apparent deviation from their natural healthy structure.

Chest.—The right lung was adherent to the costal pleura, in its whole extent, by old cellular attachments; but in every other respect both lungs were perfectly healthy. The heart and great vessels were normal in appearance.

Belly.—The liver, pancreas, and spleen were of the natural size and consistence. The kidneys were of a deeper colour than usual internally, the tubular portion being of a purplish hue, and when incised yielding a bloody exudation. No morbid alteration was observed in the stomach, or throughout the whole tract of the intestinal canal. The mucous lining of the bladder was healthy.

In the treatment of this case, some surgeons might have recommended a non-interference in the way of operation; for on his admission he had not the slightest symptom of injured brain, and had undiminished power of his mental and corporeal functions. If it had been similar to one which will be afterwards shortly noticed, that is, where there was a narrow portion driven in a short way, without any appearance of comminution or splintering, then it might have been treated by general measures, without operation; but in M'Cuaig's case, as the bone was divided into fragments, there was a risk of some of these having pierced the *dura mater*, and consequently the risk of destructive inflammation of the brain by the presence of the foreign body; and the pieces of bone were ascertained not to be so wedged but that they could be removed by the aid of the forceps and elevator, without the removal of a larger portion of bone with the trephine. As far as an inspection after the operation could ascertain, the *dura mater* was not injured, but it is quite possible that a fragment of bone might have pierced a small hole in it. Either this was the primary state of the wound, or the *dura mater* afterwards gave way under the distension of the brain from inflammatory action.

Mr Abernethy and Dr Thomson seem to be of opinion, that this generally fatal occurrence, viz. *hernia cerebri*, is a new production, while Mr Stanley has shown that it generally consists of the substance of the brain itself. In our patient's case, the protruded parts had all the external characters of brain; and it does not seem difficult to explain how the protrusion should take place, when we take into account the inflammatory action going on to a wide extent underneath; for it is very probable that increased bulk is the consequence of inflammatory action in the brain, as it is in other soft organs of the body. As has been remarked in similar cases, the patient seemed to feel little pain when the scalpel was passing through the substance of the cerebral protrusion, and experienced this sensation chiefly at its junction with the integuments.

He had no delirium or stupor until the day on which he died, and indeed scarcely any deviation from what might be considered healthy mental action, with the exception of drowsiness, and his answers, when interrogated, were always decided and accurate.

Fracture and depression of the cranium, without symptoms of compression; no operation.—I am unable to relate the particulars of this case except from memory, as the journal in which it was inserted could not be procured. The patient was a healthy labourer, and when working in a quarry was struck with a stone on the head, nearly at the vertex, on the beginning of May 1836. The wound of scalp was about an inch and a half long, and a portion of the skull of about the same length, and about one-fourth of an inch broad, was depressed to the extent of one-fourth of an inch. The wound suppurated considerably, but he never had an unfavourable symptom; his pulse was natural; his tongue clean; his appetite good; his sleep natural; and he left the hospital, about three weeks afterwards, with the wound still discharging a little purulent matter. I had heard nothing of him, although I was anxious to learn the result; but the following report of his readmission for a new injury will explain it.

Henry Allan, labourer, aged 38, on the 27th of February 1837, fell into a freestone quarry, a depth of about 20 feet. He was taken up insensible, and was found to have sustained a wound of the scalp, exactly on the *vertex*, of about half an inch in extent, which did not expose the bone. He had likewise sustained several contusions on the chest and back. The pulse was 80, full. He was a patient in this hospital in May last for a depressed fracture of skull, nearly in the situation of the present wound. The depression is still very well marked, but appears to have produced no observable effect on his mental faculties. He was discharged cured in a week.

Dislocation of the shoulder-joint.—I am induced to notice some cases of dislocation at the shoulder-joint, not from there being any thing remarkable in the cases, but from their being reduced by an ingenious machine invented by Dr Craig of Ayr. I shall not attempt to give any particular description of this contrivance; for I am not aware whether or not any account of it has been published, and the inventor himself would be best qualified to do justice to the subject. It is in the form of a chair, in which the patient is seated, his arm is buckled to an iron rod, extension is made by means of a screw, and a spring is attached, by which the extending power is suddenly removed, when, by lowering the arm at the same moment, the head of the bone slips into its socket.

This apparatus seems to be preferable to pullies in this respect, that extension is made with a screw, which can be graduated with more precision than the former. No opportunity occurred of trying it upon an old dislocation of the shoulder, but it is highly probable that it would answer the purpose. And, indeed, except in an hospital, it would not be necessary to have recourse to it, in recent dislocations of the shoulder, for simple extension so generally succeeds, that any other apparatus would be inconvenient in private practice. Four dislocations of the humerus into the axilla were reduced by this machine, after between two and three minutes extension, and their cure seemed to be equally speedy as after the usual method employed. The apparatus is so constructed as to effect reductions of the femur; but no case of this description occurred after the machine was sent to the hospital. One case of dislocation on the dorsum of the ilium occurred, which had been unreduced for several days, which was reduced by pullies after about ten minutes extension.

Excision of elbow-joint.—Robert Miller, aged 44, weaver, was admitted January 8, 1836, with disease of elbow-joint. The left elbow-joint was considerably swollen, and measured in circumference fully an inch and a half more than the right. The form of the articulation was in some degree retained, but flexion and extension of the limb were extremely limited. A fistulous opening existed, both on the inner and outer aspects of the joint, giving exit to a scanty purulent discharge mixed with synovia. The outer opening conducted the probe into the cavity of the joint for nearly two inches, and it came in contact with denuded bone. The probe could also be passed for about an inch into the opening on the inner side of the joint. The patient had in the affected joint a constant pain, which was rendered acute by moving the articulating extremities of the bones on each other. He complained also of constant pain in the wrist-joint of the same limb. The affection of the elbow-joint commenced about ten months ago; but the pain, although pretty acute at first, was not attended with much swelling. During the course of last spring an abscess formed on the inside of the left elbow, but it did not appear to communicate with the joint. More than three months before his admission, in consequence of a fall, acute inflammation took place within the joint, suppuration ensued, and a quantity of purulent matter was evacuated by puncture from its outer side.

The patient has been an invalid for many years, and, from the report of his medical attendant, has suffered from a well-marked attack of *hepatitis*, and subsequently from symptoms of *hydrothorax*, about twelve months ago.

His case was brought before a consultation, and a majority of the members agreed in thinking, that, though his general health was not in a very satisfactory state, yet excision of the bones might be practised, as they did not appear to be diseased to a great extent. The operation was delayed till the 19th, on account of an attack of influenza. On dissecting back the flaps, the soft parts were found much thickened and gelatinous. The *olecranon* was completely detached from its *fossa* in the *humerus*, and was sawn off nearly an inch from its extremity. Nearly the same length of bone was sawn off from the *humerus*, and the head of the *radius* was removed. The whole of the carious bone seemed to be removed. The portion of thickened synovial membrane which remained was completely cut away. Little blood was lost during the operation, but two small vessels were secured by ligature. In the portion of *olecranon* which was removed was a small cavity filled with purulent matter. The wound was dressed loosely with adhesive straps and roller, and placed nearly in the extended position.

January 20th. He felt last night in the elbow considerable pain, which has now subsided. There is no swelling or tension of the arm; the pulse is 120; the tongue white and moist; and the bowels open. An evaporating lotion was applied to the arm.

23d. The dressings were removed yesterday, and there was a moderate discharge of purulent matter, but no particular swelling. He feels little pain in the arm; pulse 112; tongue white. He was going on well, and healthy granulations were making their appearance, with a moderate discharge of purulent matter till the 28th, when he was seized with shivering and erysipelatous inflammation of the fore-arm. The pulse was 116, and the tongue red, and the mouth very tender.

He was directed to use the borax gargle, to have two ounces of wine daily, and lunar caustic to be applied to the arm near the axilla, in the form of a ring.

February 5th. Erysipelatous redness has not spread upwards, beyond the line formed by the caustic; but has extended downwards, over the whole hand and fingers. It was now much diminished, but there was considerable swelling of the hand, and the fingers presented some vesication, containing a sero-purulent fluid. The wound was looking well, and discharged a moderate quantity of healthy-looking purulent matter. The pulse was 108, weak; the tongue clean, and the redness and tenderness of mouth were much diminished; appetite improving; bowels regular.

He was allowed six ounces of wine daily.

February 12th. Yesterday the right-shoulder presented some reappearance of erysipelas, which next day disappeared; a solution of nitrate of silver having been applied to it. Pulse 100; tongue less red and moist; the arm discharging a small quantity of healthy-looking purulent matter; the wound nearly all cicatrized; the elbow-joint very moveable; still some œdema in the fore-arm and hand, but none in the arm; and the swelling around the elbow-joint much diminished; the bowels were open; the appetite improving; and he had little cough.

February 17th. The wound was completely cicatrized, except at two points on the inner and outer aspects of the joint; very little discharge of purulent matter, which was thick and healthy in appearance; the pulse 84, stronger; tongue clean; skin soft; slept well, and had considerably improved in strength.

February 20th. Last night he was seized with vomiting and pain in the epigastrium; pulse 96, more feeble; tongue more red; little thirst.

The wine was omitted, a domestic enema was administered, and five drops of hydrocyanic acid were ordered every fifth hour.

These symptoms of abdominal irritation subsided in a few days; the arm was looking well, discharging a small quantity of healthy-looking purulent matter at the two openings already noticed. He felt little or no pain in it, but it was still very flexible. His pulse was about 84, his appetite moderate, and his strength improving. He was now able to move about the hospital; and as a residence in the country seemed to be the most likely means to invigorate his general health, and thereby promote a more restorative action between the ends of the bones, he was dismissed on the 27th March.

This case was not so favourable as many others for excision on two accounts, his age and his previous bad health indicating a tendency to organic disease in the chest and abdomen. The chief reason, therefore, that induced the members of consultation to recommend the operation was the supposed small extent of the diseased bones; and the arguments against it, drawn from the state of his general health might have been urged with equal strength against amputation. We are not very sanguine about the ultimate success of this case; for there seems to be an irritability and weakness about his constitution somewhat indicative of internal disease, though no doubt the attack of erysipelas must have protracted very materially the restoration of his health.

Hydrocele; acupuncture.—James Snedden, collier, aged 44, was admitted on the 14th February 1837. The right *tunica vaginalis* was considerably distended, tense, diaphanous, elastic, and afforded a feeling of fluctuation. He complained only of uneasiness of the loins, caused by the weight of the tumour when standing erect. The swelling commenced about eighteen months ago, but disappeared entirely and spontaneously, according to patient's account, about six months after. The re-accumulation of fluid commenced about a year ago, and the tumour has since then gradually increased in size. A common sewing needle, headed with a little sealing-wax, was introduced into the *tunica vaginalis*, and on withdrawing it, a drop of colourless fluid appeared at the orifice of the puncture. A small piece of plaster was applied over the puncture, and a discutient lotion afterwards to the scrotum.

On the following day, viz. the 15th, the tumour was found diminished to one-half its former size, and the testicle was found enlarged and indurated. The integuments were flaccid, and had a doughy œdematous feel, from the infiltration of the fluid into the cellular texture. He felt no pain in the parts; and there was not the slightest trace of inflammatory action in the neighbourhood of the puncture.

On the 16th February acupuncture was repeated, on account of a re-accumulation of fluid, though the scrotum was still flaccid. On the 21st, the tumour had greatly diminished in size, and there was now no fluid in the lower part of the sac, but there was still some translucency at the upper part around the cord. The puncture was repeated, and next day the scrotum was perfectly flaccid, and there was no translucency in any part of it.

On the 1st of March, the tumour was again punctured on account of a re-accumulation, with the same result of nearly emptying the sac; but the fluid again collected; and on the 6th of March it was again punctured in the region of the cord, the transparency and swelling being chiefly situate there. On this occasion, and also in several subsequent punctures, the needle was moved freely about against the internal surface of the *tunica vaginalis.*

On the 12th, the swelling had diminished less rapidly than before, and there was still some fluctuation. The puncture was repeated. He was now put on calomel and opium, which affected his mouth in about eight days; and the punctures were repeated every four or five days until he left the Infirmary on the 8th of April; but very little change was effected in the swelling, which was now chiefly confined to the neighbourhood of the cord, and was still diaphanous. The enlargement of the testicle, however, diminished considerably after the operation of the calomel and opium.

James Kelly, aged 21, piecer, admitted 15th March 1837. The right *tunica vaginalis* was greatly distended with fluid, and was extremely tense and elastic. The swelling was diaphanous, and the testicle was seen, by transmitted light, to be somewhat larger than natural at the upper and posterior part. The hydrocele commenced originally about three years ago, and has been twice tapped within the last six months. The general health was good. In this case, acupuncture with a sewing-needle was performed four or five times, at the interval of two or three days, with the effect of diminishing the size of the swelling, but there always remained in the sac a considerable portion of fluid, and much more than in the case previously related. He left the hospital after having been there about a fortnight; but I understand that he returned in about six weeks, and that he was tapped and treated by the usual method, by injection, for the radical cure of hydrocele.

This mode of attempting to cure hydrocele radically has excited some attention of late amongst surgeons, from its novelty and simplicity; and were it in general ultimately successful, it would be the most simple and at the same time the most extraordinary operation that is recorded in surgery. Even upon the supposition that it is only a palliative or substitute for the common plan of tapping with a trocar, the discoverer is entitled to much credit; for a puncture with a sewing-needle is attended with scarcely any pain, and the most timid of men would submit to it without apprehension. The results arising from the treatment of two cases are not enough for drawing any certain conclusion; but certainly they tend to establish this point, that no particular change is effected upon the internal coat of the *tunica vaginalis*, and that the fluid reaccumulates as after ordinary tapping with a trocar.

In both the cases that have been detailed, the needle was introduced perpendicularly to the surface of the tumour, and in almost every instance, the drop of clear fluid, which is reckoned characteristic of the acupuncture being properly performed, presented itself. In the first case, after having simply inserted the needle for a considerable number of times without any apparent effect in preventing a re-accumulation, it was in the future operations moved about, along the internal surface of the *tunica vaginalis*, with the intention of exciting some inflammatory action. This, however, had no better effect than the simple introduction of the needle.

It may be stated that the cases above-mentioned were not well adapted for the plan, for in both the testicles were enlarged. This certainly is an objection to the success of acupuncture, as well as to every other plan for a radical cure of hydrocele; but a little enlargement of this organ is a very common occurrence in this disease, and in the first case detailed the enlargement had almost completely subsided before he left the house. It appears to me that this operation is not likely to supersede the radical cure by injection, but that as a palliative it ought generally to be preferred to the use of the trocar; at the same time, I am of opinion that a frequent and long-continued use of the needle may in some cases effect a radical cure; and this view is supported by the fact, that after acupuncture has been repeated several times, the re-accumulation of fluid goes on less rapidly than after the first or second operation.

Double Hæmatocele; tapping; Erysipelas; Incision of the Tunica Vaginalis.—Thomas Regans, blacksmith, aged 28, and of healthy constitution, was admitted on 21st November 1836. The scrotum was enormously enlarged and presented on each side of the *raphe* a tense, elastic, fluctuating tumour, of an ovate-oblong or somewhat pyriform shape. The tumour on the right side was slightly larger than that on the left; but neither were distinctly diaphanous. He experienced no uneasiness from the tumour except from its great weight. The swelling commenced about five years ago on the left side, and in a year afterwards on the right. The swelling of the left side has been tapped four times, and that of right six times. The operation was again performed on the right side about four days ago, and a quantity of fluid, for the first time bloody, was drawn off. In the course of twenty-four hours it had regained its former magnitude.

November 23d. Yesterday about twelve ounces of bloody-coloured fluid were drawn from each tumour, and testicles on both sides were found enlarged and painful on pressure. Epidydimis on right side was also in a similar condition. Was affected this morning with a rigour, and there was considerable redness over the whole surface of scrotum. The pulse was 112, moderate, the tongue white and moist. The scrotum was covered with mercurial ointment, and he was ordered a mercurial pill every night, and small doses of tartrate of antimony. The erysipelatous inflammation continued to increase, the scrotum became enormously swelled and very painful, and in a few days suppuration ensued. An incision was made on each side into the *tunica vaginalis*, which gave exit to a large quantity of puriform fluid. Considerable discharge of matter ensued, he was troubled with diarrhœa, and his pulse was about 96, and rather feeble. The antimony and mercury were omitted, and he was now treated with sulphate of quinine, and a few ounces of wine daily. On the 2d December there was increase of redness and swelling, which speedily subsided under the use of a lotion of *Nit. Argent.* in the proportion of ten grains of this salt to one ounce of water. A tent was now introduced into both openings, as they showed some tendency to close up and confine the purulent secretion, which was still going on to a considerable extent in the sac. Notwithstanding the use of the tents, the openings became too small for the free exit of the purulent matter; they were therefore enlarged with a bistoury on 14th December, and from that time the swelling and discharge of purulent matter gradually diminished, and he was dismissed cured on the 14th of March.

At the time this patient was tapped in the hospital, erysipelas was prevailing to a considerable extent in the ward where he was placed, and he was attacked with this disease in little more than twelve hours after the puncture into the *tunica vaginalis* was made. At the commencement of the erysipelatous attack, he was treated with mercurial inunction and a mercurial pill every night, with the double purpose of treating the erysipelas, and relieving some enlargement of the testicles which were found to exist. This treatment however, it was necessary to omit after the occurrence of suppuration; for his pulse became rather feeble, and he had a tendency to diarrhœa. The tonic plan was then adopted, and he improved under it, as I have frequently observed in other cases of a similar description.

Incision of one of the *tunicæ vaginales* for the cure of hydrocele is frequently attended with rather smart symptoms; but in this case both were laid open at once, and there was in addition the erysipelas to contend with. I was afraid that he would at one time have sunk under the constitutional irritation and debility which followed the two openings; but his constitution appeared to be good, and the early tonic plan of treatment seemed to be beneficial.

Elephantiasis of Fore-arm and Hand; amputation of the Arm.—John M'Donald, aged 36, farm-servant, Long Island, was admitted March 30th 1837. The right hand was enormously enlarged, and had some resemblance to an elephant's foot in size and shape. It measured 8 inches in breadth from little finger across dorsum of hand to thumb, and upwards of fifteen inches in circumference. Each finger measured 4 inches in circumference, with the exception of the little one. The swelling was chiefly confined to the hand and wrist, but was perceptible as far as the elbow. From the elbow to the shoulder-joint the arm was completely shrivelled, and it did not measure more than 3 inches in circumference, immediately below insertion of pectoral muscle. The integuments were extremely hard, and of a reddish colour at the top of the shoulder, and the induration extended along the whole of the arm and hand. On the back of the hand and fingers, the skin was tuberculated and thrown into thick folds, while in some places it resembled shagreen in roughness. On the under surface of the fingers, and in the palm of the hand, the integuments were of natural firmness, but were insensible to the touch. The whole arm and hand were equally destitute of sensation on their external surface, but he was frequently troubled with acute pain in the wrist-joint. A thin sanious discharge exuded from the spaces between the fingers, and from small superficial ulcers on the back of the hand. Large veins were seen ramifying on the arm, and there was a large varicose branch at the inner margin of the biceps. Motion at the shoulder-joint was imperfect, and he could not bend the elbow, nor raise his arm without assistance. The skin had a puckered appearance at the top of the shoulder, and where it covered the right scapula it was mottled with whitish spots.

The general health was pretty good, and other parts of the body were well-formed and well-conditioned. This affection of the arm commenced about fifteen years ago without assignable cause. The disease commenced at the shoulder, which became swollen, painful, and tuberculated. The swelling afterwards shifted along the arm, and about seven years ago the hand became affected. The members of consultation agreed that amputation was the only method of getting rid of this monstrous incumbrance, which was a source of great annoyance, and frequently of acute pain to him. The patient seemed very happy at the proposal, and consented immediately on its being mentioned to him. The place selected for the amputation was the middle of the arm, a point where the biceps muscle and integuments appeared not to be involved in the disease. A single flap was formed on the inner aspect of the arm, by transfixing the biceps muscle, and cutting downwards, and afterwards dissecting up a small portion of the integuments from its outer side. The bone and muscle and also the other soft parts had a healthy appearance.

After the limb was removed, an incision was made along the lower part of the fore-arm and palm of the hand, and the cellular texture was found about an inch in thickness, and infiltrated with serum, the muscular substance being paler than natural. There was also some serous fluid in the wrist-joint. On dressing the arm four days after the operation, the flap was found adherent, very little suppuration ensued, the ligatures came away in the usual time, and he was dismissed in good health, with the stump completely healed, on the 8th May.

In this case there seems to have been some disease of considerable standing about the shoulder, where there were numerous white marks on the skin resembling the cicatrices of some cutaneous affection; and it is not unlikely that this may have been some modification of sibbens, a disease very prevalent in the western islands of Scotland.

Whether the elephantiasis was excited into action by this or not, it is impossible to say, but it is by no means improbable; as writers on this subject have remarked, that cutaneous eruptions occasionally cause it, or at least precede its appearance. Against the propriety of amputation, it might have been urged that the patient's general health was pretty good, and that though it was a great annoyance, there was no immediate risk of his life; while if his constitution at length began to suffer much, that then the operation might be had recourse to. On the other hand, it might be urged in favour of amputation, that the patient suffered very considerable pain in the wrist-joint; that the elbow-joint was quite stiff; that he could not attend any employment with such an appendage attached to him; that there was a certainty of its curtailing the period of his life, and the getting rid of it would at least render his existence more comfortable, if it did not protract it; while he himself was almost delighted with the prospect of an amputation.

Painful Cicatrix on the Dorsum of the Foot; excision along with a portion of the extensor tendon.—John Jamieson, aged 48, a healthy carpenter, was admitted on the 20th February 1837.

On the dorsum of the left foot there was a portion of smooth hardened integuments resembling a cicatrix, extending the whole length of the fourth metatarsal bone, in the direction of the tendon of the *extensor longus digitorum*. The cicatrix was about an inch and a-half in length, and appeared to be intimately adherent to the extensor tendon. The fourth toe was slightly retracted, and was constantly maintained in that position. It was the seat of a constant prickly pain, which was always increased, and often rendered intolerable by standing long on left foot. Had been totally unable to follow his usual employment for the last six months. The cicatrix was the result of a wound inflicted by an axe about twenty-five years ago; but he never experienced any uneasiness from it, till about two years ago, when a good deal of inflammation was produced around it, by a caustic, which had been applied as patient stated, "for backing a bruise on the sole of foot." The pain and retraction of tendon commenced shortly afterwards, and has slowly but gradually increased in intensity. Leeches and afterwards blisters were repeatedly applied, but without producing any amendment. The case being submitted to a consultation, it was agreed that the cicatrix should be dissected out along with the portion of the extensor tendon, as there was retraction of the toe. This was accordingly done on March 3d, and the wound dressed with adhesive plaster. Very little suppuration ensued, and the wound was completely cicatrized on the 31st March, and the report taken at that time states, that although he still felt a little pain, yet that it was trifling to what it was before the operation; and that he could walk about with comparative ease.

Polypus Nasi of twelve years standing. Evulsion, along with a portion of diseased bone.—William Frame, aged 26, was admitted on the 26th April 1837. For the last twelve years he had been affected with polypous growths in the left nostril, extending backwards into the posterior *nares*. About eight years ago, a polypus excrescence, about the size of a hen's egg, projecting downwards into pharynx, was removed by ligature in this hospital. The nostril afterwards became obstructed by the rapid growth of the *polypi*, which were reproduced in the course of three or four months. For several years past he has had the left nostril cleared of these obstructions, about four times a-year; and has at different times submitted to the application of escharotics, such as chloride of zinc, &c. but without the least benefit. On admission, the nostril was found almost completely blocked up, and *polypi*, which were situated pretty far back, were seen when he made a forcible expiration through the nostrils. A portion of bone was felt bare with the probe.

On introducing the polypus forceps into the nostril, a portion of bone was laid hold of along with the growth, and by gently mov-

ing the instrument, it was ascertained to be partially loose, and not very large. It was then detached with a twisting motion, and brought cautiously out of the nostril. Large polypous excrescences were found intimately adherent to it, and so firmly, that they could not be detached without tearing off the periosteum. The bone was about half an inch broad, and somewhat square in its shape. Rather profuse hemorrhage followed, which was supressed by introducing a dossil of lint into the nostril. Two days afterwards, on introducing the probe, more denuded bone could be felt; the forceps were again introduced, and another piece of bone was extracted from the back part of nostril, with several ounces of firm whitish excrescences attached. The nostril seemed now perfectly free from any obstruction; he could breathe through it with perfect freedom, and the probe detected no more bone. He left the house in a few days after, as he felt himself quite well. I am sorry that he left the hospital before we were able to ascertain satisfactorily whether any portion of the polypus would be regenerated; but this is not very probable, for it undoubtedly originated in the periosteum of the diseased bone that was completely removed, as far as could be ascertained.

No other method of treatment could have effected any thing but a palliation of the symptoms, for though it had been possible to evulse the growth completely from the nostril, still the roots remained attached to the periosteum, and would have, in a short time, attained their former size; and with regard to escharotics, their efficacious employment in a canal like the nostril was not at all practicable. This plan was therefore justifiable not only from the long continuance and apparently incurable nature of the case, as well as that diseased bone was detected, showing some connection with it and the polypous excrescence; and the examination of the bone afterwards proved this opinion to be correct.

Malignant Ulcer under the left ear cured by chloride of zinc.—Neil Boyd, aged 40, servant, admitted September 13, 1836. Under the left ear was situated an ulcer about half an inch in diameter, and extending from angle of jaw to lobule of ear, the under surface of which was involved in the ulcerative process. The ulcer was slightly excavated, presenting a dry grayish-coloured warty bottom, from which there was occasionally a slight bloody exudation. Its margins were thickened, callous, and everted, the integuments being painful on pressure, and of a dusky-red colour. The ulcer first appeared above six years ago in the form of a small red *papula*, which was attended with a lancinating pain. He complained of a dull uneasy sensation in seat of ulcer, but the pain was never very acute. No enlargement of submaxillary glands. On the 13th September, chloride of zinc, uncombined with flour or gypsum, was applied to the ulcer, and it has produced to-day (14th) a very thick slough, which is firmly adherent.

September 16th, The slough is detached; the surface of ulcer has a more healthy aspect, and is covered with purulent secretion. The chloride of zinc was repeated every three or four days, according as the slough was sooner or later detached, and was used six or seven times altogether. After the ulcer had assumed a healthy character, simple dressing, and the occasional light application of the nitrate of silver were employed, and he was discharged on the 6th November, the ulcer being completely cicatrized. The chloride of zinc in this case was not combined with any other substance, as is recommended by some writers; but was simply applied to the ulcer, and allowed to deliquesce on its surface, using the precaution of preventing any of the fluid formed coming into contact with the neighbouring parts. Poultices were used during the whole time that this caustic was employed. The chloride of zinc seems also to answer well in removing warty excrescences, and I used it lately in a private case for removing a malignant looking excrescence, situate at the junction of the *ala* of the nose and the cheek, about the size of a gooseberry, and partially ulcerated. It had existed for seven years, was gradually increasing in size, and was the seat of occasional lancinating pain. The chloride of zinc was applied three times, at the interval of four days, and after the last slough was thrown off, there remained a pretty deep excavation, but which was speedily filled with healthy granulations, and soon cicatrized completely, leaving no suspicious trace of the former disease.

The chloride of zinc, however, seems only to be superior to many other caustics, in cases when the destruction of a considerable thickness of texture is required, or where the removal of an excrescence by a caustic is preferred by the patient to the knife; for the nitrate of silver, as shall be noticed under the article ulcers, seems to be superior in promoting a sound action, when the unhealthy stratum of the ulcer is superficial.

Ulceration of the cartilages of the knee-joint—ankylosis.—Dennis M'Gunnigall, aged 45, fishmonger, unhealthy in appearance, was admitted on the 6th January 1837. The right knee-joint was the seat of much general swelling, and when measured around the patella, it exceeded the other in circumference by nearly an inch. It retained the form of the articulating ends of the bones, and there was no part of joint which afforded any evidence of fluctuation. The limb was constantly kept in a half-bent position, and the slightest attempt at motion of the joint produced very acute pain, and it was rendered most excruciating when the patella was pressed against the articulating surfaces of the femur and tibia. The pain was occasionally so intense during the night as to deprive him of sleep. The disease commenced eight weeks ago suddenly, and without assignable cause. The knee had been twice leeched and blistered without much benefit; the pulse was 96, and the bowels were open. Leeches, blisters, and moxa were several times employed after his admission, but with very little benefit.

On the 10th of February, fluctuation was perceptible on the inner and outer aspects of the joint, and also in the lower and anterior part of the thigh, and there was a good deal of œdematous swelling of the foot, leg, and thigh, as high up as groin; pulse 80, feeble. The swelling of the joint increased, suppuration ensued, and the matter was discharged by a spontaneous opening on the inner aspect of the leg, a few inches below the knee. Abscesses were afterwards formed at several places, on the upper part of the leg and the lower part of the thigh, which were opened, and several counter-openings were made. The discharge of purulent matter from these numerous sources was enormous. He was often literally deluged; his strength, which at first was considerable, was now fast decreasing; his pulse was 120, very feeble; his tongue rather red, but moist; and he had perspirations.

A consultation was called; but amputation was considered quite inadmissible in his present state. His strength was supported by nourishing diet, (for his appetite continued good,) ten or twelve ounces of wine daily and sulphate of quinine; while a free exit was allowed to the purulent matter, and the limb bandaged from the toes to the groin. The discharge in a short time afterwards began to diminish, and his strength to improve, while the other functions were becoming more healthy. The following report was taken on the 29th April. The swelling of leg and thigh now nearly reduced to its natural size. There is very little motion in knee-joint, and he now feels very little pain around the patella, sinuous openings in leg and ham are completely closed, with the exception of one on the outer aspect, below the knee-joint. The pulse was 76, moderate; the tongue clean and moist; the bowels open; the appetite good; sleeps well, and has rarely any sweatings at night. In a month afterwards the joint was completely ankylosed, and maintained very nearly in the straight position, and he was able to walk about on crutches. He was in a short time afterwards dismissed cured.

The diagnostic marks of ulceration of the cartilages of a joint are not always very decided, especially in the commencement of the disease; but there were certainly good grounds for believing that this result had taken place in the case above detailed. The swelling had the form of the joint; the slightest attempt at motion produced excruciating pain, and also on pressing the articulating ends of the bone together. The pain was most severe during the night, and there was tumefaction. No fluctuation was observed in the joint for more than three months after the attack;

but at that period it was distinctly ascertained, and in as short time afterwards, the accumulated matter was discharged by an opening a little below the ham. This case is an example of recovery from a very severe form of ulceration and suppuration of the knee-joint; for in the great majority of cases, unless amputation be had recourse to, the disease proves fatal; and though the patient's strength was supported during the suppurative process by the large quantity of stimulus he received daily, for a long period, yet the same treatment would generally fail in producing a cure.

Fungus of the Testicle.—James Arneil, aged 24, of impaired constitution, weaver, admitted May 12, 1836. About six months ago, after a long walk, he observed the right testicle to become swollen and painful. These symptoms were relieved by leeches, but suppuration afterwards ensued, and two fistulous openings were formed. These discharged a thin serous fluid, but the glands remained stationary in size, till about a month ago, when one of them began to enlarge, and a pretty firm tumour, about the size of a pigeon's egg, protruded. On his admission the ulcerated opening was about two inches and a-half in diameter, and its edges were inverted, the fungus projected about three quarters of an inch above the level of skin, and had a smooth sloughy gray appearance. The tumour seemed to spring from body of the testicle, which was found much enlarged, but the cord was not diseased. The probe could only be passed for a short way under the margins of ulcer; but at the lower part of scrotum there were two small sinuous openings, which led into a suppurating cavity, a probe passing inwards for about an inch and a-quarter towards raphe. The left testicle was also enlarged, and had become affected about a fortnight before his admission. He had undergone a course of mercury and a variety of other treatment with slight benefit. He was directed to take Lugol's solution of iodine in the dose of twenty drops three times a day; and poultices were directed to be applied to the scrotum.

May 20th. A few days ago, the projecting part of the tumour was removed by successive slices without either pain or hemorrhage; a sharp-pointed probe was then thrust into the remaining portion, which was enclosed by the integuments to the depth of an inch; but still without drawing blood or giving pain. The poultices were continued, and the tumour gradually protruded, and at the date of this report it was entirely exposed. It consisted of a body resembling the half of a hen's egg, which had been divided by a longitudinal section. It was attached on its convex side to a large irregular indurated mass contained in the scrotal sac. The fungus was removed easily by separating its connections with the testicle, by means of the sharp end of a probe. There was slight oozing of blood, but he scarcely felt pain during the operation. The fungus on inspection seemed to be a mass of fibrous tubes possessing considerable tenacity. His strength was supported by nourishing diet and sulphate of quinine; the iodine was continued, but the enlargement of both testicles was not much lessened; though cicatrization of the ulcerated opening was proceeding very favourably. Mercury was again tried about the end of June, and under its influence the enlargement of both testicles was greatly diminished. He was dismissed on 11th July with the ulcers almost cicatrized, and the testicles very little enlarged, country air being recommended, so as to improve his general health. This case appears to be similar to the disease described by Mr Lawrence in the Edin. Med. and Surg. Journ. for 1808. It seemed to possess no malignant character, was firm in its texture, but not granular on its surface; had its origin from the body of the testicle, and was totally insensible. As the line of separation between it and the testicle could not at first be come to without considerable dissection, as there was no urgent symptom, and as the fungus was observed to be gradually protruding, I only at first incised it on a level with the integuments, and waited a few days longer, before its entire extirpation was attempted. It was then easily accomplished, without causing any pain, and indeed I have no doubt that in a short time, if it had been left to nature, a spontaneous detachment would have been the result.

Escharotics have been recommended for the destruction of such fungi; but certainly they would have been very inefficient in a case like this, and even though they had succeeded, were greatly inferior to a separation by an instrument, the employment of which occasioned neither pain nor hemorrhage.

Extensive suppuration in the Knee-joint from an injury.—Adam Dick, aged 18, carter, of unhealthy appearance, was admitted on December 23, 1836. About ten days previous to his admission he fell upon the right knee. The right thigh became greatly swollen, red, and painful on pressure. The right knee, on admission, was about double the size of the opposite one; and immediately above and to the inner side of joint, the swelling was tense, elastic, and distinctly fluctuating. Twenty leeches were applied to the knee, and he was directed to take calomel and opium.

The leeches were again applied on the following day; but the swelling was, notwithstanding, increasing, a throbbing pain was experienced, the *patella* was elevated, and fluctuation in the cavity of the joint was distinctly perceptible. The pulse was 112, feeble, and the tongue was white. A small opening with a lancet was made on the outer side, a little below the lower termination of *patella*, and about fourteen ounces of dark-coloured purulent matter were evacuated. The wound was afterwards closed with adhesive plaster. A bandage was applied, with a splint behind the knee, in order to prevent any motion of the joint. The calomel and opium were omitted, and he was ordered two grains of sulphate of quinine twice a-day.

December 29th. The swelling had increased to its former size; and on removing the straps, adhesion of wound was found not to have taken place, and about twenty ounces of dark-coloured purulent matter were discharged. There was considerable erysipelatous redness around the knee-joint and lower part of the thigh. The pulse was 104, feeble; the tongue white and moist; he perspired copiously; and the bowels were open. The limb was put up as before; he was ordered two grains of sulphate of quinine three times a-day, six ounces of wine, a draught of solution of muriate of morphia at bed-time, and the application of the nitrate of silver, in the form of a ring, to the upper part of the thigh, near the groin.

December 31st. The swelling and tension of the knee and thigh had now very much subsided, and bloody-coloured purulent matter was freely discharging from wound; pulse 88, rather stronger; tongue clean and moist; appetite improving. The quinine and wine were continued, along with light nourishing diet; while simple dressing and a bandage were applied only to the wound, as it did not appear practicable to heal up the opening into the joint.

After this period he continued to improve; and he was discharged, cured, on the 16th January 1837, with the opening cicatrized, but with some stiffness of the joint, which in all probability would be removed by gentle friction and the gradual use of the limb.

Suicidal wound of the throat communicating with the pharynx.—Archibald Campbell, aged 38, was brought to the hospital on the 17th August 1836. In the throat was found a wound extending from one ear to that of the opposite side, and it communicated with the pharynx immediately above the centre of the *os hyoides*. Considerable hemorrhage had taken place before his admission, but at that period it had ceased. The wound was closed by several sutures, and dressed with adhesive plaster, and the head was approximated to the sternum by means of a bandage. The patient had received an injury of the head sometime previously, and had ever since been subject to fits of insanity. A flexible tube was passed into the œsophagus, but owing to the intractable state of the patient, it was not allowed to remain. It was found afterwards on trial, that he could swallow liquid food in the horizontal posture without its escaping by the wound, whereas in the erect posture it uniformly flowed out. The greater part of the wound was completely cicatrized in about a week; but the central portion seemed to be in a fistulous state, and a probe could be passed through it into the pharynx. His pulse was 71, but rather feeble. He was allowed four ounces of wine daily, and arrow-root gruel, and the wound was treated with nitrate of silver, by introducing a cylinder of it into the opening, to the extent of about half an inch daily. Under this treatment the opening was completely closed by the 4th September, and he was discharged cured on the 23d.

His insanity, however, was not abated, and it was intended that he should be placed in an asylum.

Iritis cured by oil of turpentine.—Felix O'Neil, aged 33, weaver, admitted 18th August 1836. The vision of the left eye was obscure and confused; the pupil contracted and irregular, but not entirely motionless; the iris discoloured, and a minute lymphathic deposit was observed towards its temporal edge. The sclerotic vessels were injected, and formed a complete radiated zone around the cornea. There was no effusion into the anterior chamber. He had slight circum-orbital pain, also pain in the eyeball, intolerance of light and lacrymation. The eye became affected about a week ago, and he was lately under treatment for a syphiloid disease, and had used mercury. The general health was pretty good. He had a dose of Epsom salts, and was afterwards ordered to take twice a-day a drachm of oil of turpentine made into an emulsion with gum and white of egg. Three days after he commenced the use of the turpentine, he complained of nausea, and pain in the region of loins. It was therefore intermitted for a day or two, and he was ordered a dose of castor oil and calomel, and twelve leeches were applied around the eye.

On the 30th, Vision was somewhat better, and the inflammation of the sclerotica a little abated. The oil of turpentine was again resumed in the dose of half a drachm, four times a-day, and the extract of belladonna was applied around the eye. On the 6th of September the pupil was found contractile, and was only confined at one point towards the upper part of nasal edge, and vision was greatly improved; but there was still a little zonular redness of the sclerotica. He continued to improve, and he was discharged cured in about a fortnight afterwards.

He had about two months afterwards a slight return of the disease, which was speedily removed under the use of the turpentine with the addition of a blister to the nape of the neck.

Ulcers—Employment of the Nitrate of Silver.—Much has been written upon the cure of ulcers, the treatment of which is often found exceedingly intractable. Each practitioner has his own peculiar views and peculiar modifications of treatment, which he is apt to think superior to all others. This has given rise to a kind of scepticism amongst medical men, regarding any thing that is advanced respecting the superiority of a particular plan, and they are apt to believe that the beneficial results attributed to it arise altogether from fancy or inaccurate observation. I shall therefore content myself with simply stating the mode of using the lunar caustic which was adopted in the hospital, and the results which, in my opinion, may be drawn from its employment.

It was used in the solid form and in solution, one of the proportions being equal parts of the nitrate of silver and water, and the other ten grains of the salt to one ounce of water. In cases of simple ulcers, where there was a slight tendency to exuberant granulations, the ten grain solution, applied every second day, was sufficient to give a healthy tone to the granulations; and, in some cases of burns, this proportion was employed with decided advantage. But where the granulations become decidedly fungous, the saturated solution must be employed, as the former has too little power in destroying their vitality. When a burn is very extensive, the patient cannot endure the pain which results from its application to the whole raw surface, and in such cases it may be applied to the margins of the ulcer to the extent of about half an inch, all around its circumference.

Irritable Ulcer.—In the treatment of this, the caustic may be used either in the solid form, or in that of the saturated solution. When the slough is deep, or when the edges of the ulcer are much undermined, the solid form may be preferred, because it can be insinuated more correctly into these parts than a hair brush, and it ought to be applied very fully, in order to destroy as speedily as possible the character of the ulcer. When this is done thoroughly, it gives great relief to the pain after the immediate effects of the caustic are dissipated. The surrounding inflammation attendant on these ulcers may also be much relieved by the application of the ten grain solution of the same salt. In some phagedenic ulcers which were spreading rapidly, the nitrate of silver has been dissolved in nitric acid, and has proved very effectual in checking the destructive spreading of the disease. The common commercial nitric acid, however, will not answer, for it contains in general a considerable proportion of muriatic acid, which throws down the silver in the form of an insoluble chloride.

Callous Ulcers, which were very frequent in the hospital, were treated in the following way. The ulcer, and particularly the callous margins, were rubbed freely with the solid lunar caustic. An emollient poultice was then applied, and in two days the application of the caustic was repeated, in the form of the saturated solution, if the callous margins of the ulcer had been sufficiently acted on. At a certain period of the progress of this, as well as of other species of ulcers treated with the nitrate of silver, generally when they have contracted to a half or two-thirds of their original size, the cicatrization ceases to be so rapid, it is then proper to change the application. The ointment of the deuto-ioduret of mercury answers very well; two grains of the ioduret to one ounce of axunge; or the application of adhesive straps according to the method of Baynton, along with the employment of a bandage.

Sloughy Ulcers.—Where the slough is very deep, or where the cellular texture is involved to a considerable extent, the nitrate of silver is not so well adapted for its destruction and consequent detachment as potassa or chloride of zinc; for it is decomposed so rapidly by the salts contained in the fluids of the body, as to render its power much less than in other circumstances it might be. The chloride of zinc and potassa, on the contrary, sink deeply into any texture to which they are applied, from their great affinity for water, and consequently produce a much more extensive decomposition of the parts to which they are applied. In cases, however, where the slough is superficial, the nitrate of silver is fully as efficacious; and the following case will illustrate the effects of a comparative trial of its powers, and that of the chloride of zinc.

Mrs M'Lean, admitted February 1st, 1837. On the *mons veneris* there is a sloughy superficial ulcer, of an elliptical figure, and about the size of a crown-piece. The right half of the upper lip has been completely destroyed by ulceration, which still continues to spread upwards, in a semicircular direction, from the right commissure of lip to the centre of upper lip.

The sore on the *mons veneris* was first observed about a year and a-half ago, and at first had a vesicular appearance. The mouth became affected about half a year afterwards with a vesicular eruption; but it is only of late that the ulceration began to spread along the upper lip. The ulcer on the *mons veneris*, which was the largest, and had been of longest continuance, was treated with the nitrate of silver, and that on the lip with the chloride of zinc. Internally she had sarsaparilla, and a grain of proto-ioduret of mercury night and morning.

She was moderately salivated in about eight days, when the proto-ioduret of mercury was omitted, but the sarsaparilla was continued. These two escharotics were applied every second day, as stated above, and simultaneously. The ulcer on the *mons veneris*, under the nitrate of silver, was cicatrized in three weeks, while that upon the lip was not healed up until the expiration of a month.

With regard to the employment of the proto-ioduret of mercury in this case, it may be mentioned, that it was used because it was believed that the ulcers were syphilitic, although she denied ever having had any primary sore. This preparation is in general very mild in its action, and causes ptyalism in about eight days, when given in the dose of one grain night and morning. It is rather more apt to purge than the mercurial pill; but this is corrected by the addition of from a quarter to half a grain of opium to each grain of the ioduret, made in the form of a pill. It seems peculiarly adapted for those cases of syphilis that occur in scrofulous constitutions, for it has a powerful effect in resolving scrofulous swellings; and for this purpose it may be employed not only internally but externally in the form of ointment.

The nitrate of silver has been employed in a variety of other affections of the skin with the same beneficial results, such as lupus, and *lepra syphilitica*; and in lupus, it has most effect when applied in the solid form, and rubbed very freely upon the ulcerated and tuberculated places. Indeed, it may be stated generally, that unless the nitrate of silver be rubbed very freely upon a part, a superficial detachment will only be effected; and this accounts for the saturated solution not being so efficacious in certain ulcers as the solid nitrate; but the former possesses the advantage of not producing any mechanical irritation when applied to a tender surface.

The advantages of the nitrate of silver may be summed up in the following principles. 1*st*, Simple granulating ulcers cicatrize with great rapidity under its employment. 2*d*, It diminishes the pain and inflammation of irritable ulcers, after the immediate effects of its application are dissipated. 3*d*, It destroys the sloughs which may have formed on the surface of ulcers, without any danger of involving any important vessel in the neighbourhood. 4*th*, It promotes in almost all ulcers a state much disposed to form healthy granulations, at least to a greater extent than any other caustic.

Phlebitis is a disease not very uncommon, as a result of injuries and operations, is so generally fatal, and the nature and treatment of the disease so imperfectly understood, that any facts connected with its occurrence, though they exhibit nothing particularly new, are at least useful in tending to keep alive a spirit of investigation into the nature of this obscure subject.

A short account of one or two cases that occurred in the hospital, with their necroscopic appearances, shall therefore be given.

Phlebitis simulating erysipelas.—K. Sinclair, aged 80, admitted December 20th 1836. About ten days previous to admission, after exposure to cold, this woman was seized with severe rigors, followed by pain, heat and redness in left foot and leg. The left lower extremity was found greatly swollen, of a dusky red hue, and pitted deeply on pressure. The redness and swelling extended as far up as the middle of the thigh, and carious bone was felt through a sinuous opening in the great toe. The pulse was 92, feeble; the tongue brown and dry; and the bowels constipated. She was ordered castor oil, and twelve leeches to the leg; and an incision was made through the integuments over the ankle. A ring was formed at the upper part of the thigh, by means of lunar caustic, and a ten grain solution of the same salt was applied to the whole surface of the inflamed limb. Next day her pulse was 108, more feeble, and she was passing feces and urine involuntarily. She was ordered wine, sulphate of quinine, and a blister to the head. On the 22d, the pulse was 120, more feeble; the features collapsed; swelling of the thigh had not extended above the ring of the nitrate of silver; several abscesses in the leg were opened. She died on the following morning.

Sectio cadaveris.—The cellular substance of the leg was found completely infiltrated with purulent matter. The saphena vein had a firm, corded appearance, and when cut across gave exit to a quantity of thick purulent matter. The other superficial veins of the foot and leg were in a similar condition. The saphena vein presented the appearance above described, only as far up as the caustic line, that was made around the thigh, and there appeared to be no inflammatory redness in this vessel farther up. The metatarsal bone of the great toe was slightly carious.

The viscera of the chest and abdomen healthy, and there were no purulent deposits. This appeared to be a case of idiopathic *phlebitis*, and yet this conclusion cannot be drawn with much certainty, for there was ulceration and caries of the great toe, which might be the result of an injury, though she made no statement of this kind; but she was very old, and somewhat incorrect in her statements. It resembled very much a case of erysipelas, and as the swelling on her admission was very considerable, no enlarged veins were detected. The ring of nitrate of silver was formed at the upper part of the thigh, for the purpose of preventing the extension of the inflammatory action; and it is somewhat singular, that purulent matter in the saphena vein could not be detected higher than this point. This may be a mere coincidence; but it would induce me to employ the same practice in other cases of *phlebitis;* for it is possible that it may have some effect in checking the progress of venous inflammation, more especially as cellular and integumentary inflammation is almost uniformly an accompaniment of the disease. No purulent deposits, as is generally the case, were found in any of the cavities, so that the disease, in this respect, had not terminated in the usual phenomena. From this circumstance, and the extension of the venous inflammation being checked in its progress, there might have been a chance of her recovery, had she not been so old and infirm.

Phlebitis from injury of the shoulder-joint.—Anthony Ward, labourer, aged 27, was admitted on the 22d of July 1837. This man, two months ago, received a violent blow upon the right shoulder from an iron door being driven against him. The shoulder afterwards became greatly swollen, red and painful; an abscess formed in the seat of injury; and about a fortnight before his admission burst spontaneously, discharging a considerable quantity of purulent matter. Since that time there was at the outer margin of the axilla a fistulous opening, which discharged a thin sero-purulent matter. Into this opening the probe could be passed upwards and outwards for about 4½ inches under the integuments, and its point could be felt immediately in front of the acromion. The probe could also be passed downwards for about 1½ inches, but without coming in contact with the bare bone. No communication with the joint could be discovered. He had two indolent ulcers on the leg with livid margins. A counter-opening was formed at the top of the shoulder, and a weak solution of nitrate of silver was injected into the sinus.

26th July. The discharge was more puriform, the pulse 76, and copious perspiration during the night took place. The symptoms continued much the same till the 30th July, when he was seized with a rigor; the pulse was 100; and the tongue furred; the shoulder was less painful; and the discharge of purulent matter was considerable.

On the 2d of August the breathing was oppressed, the features somewhat shrunk, the pulse 100, weak, the tongue dry, and the wound discharging profusely. He was ordered a few ounces of wine.

On the 3d of August delirium came on; he had some diarrhœa; and the breathing became hurried and laborious, but he complained of no pain of the chest. The head was shaved, and a cold lotion applied to it, a blister to the chest, and opium internally.

August 5th. Diarrhœa abated; but the breathing was more oppressed; and he was more delirious and the features collapsed. The extremities also were swollen, and an erysipelatous blush appeared over the calf of the left leg; perspiration very profuse. He died in the evening.

Sectio cadaveris.—On cutting through the integuments of the shoulder a large cavity was exposed, which completely encircled the deltoid muscle, but it did not communicate with the articulation of the shoulder. The outer wall of this abscess was formed by the integuments and a thin layer of the fibres of the deltoid; internally it had a greenish rugose appearance, and was covered with a thin sero-purulent secretion. The cavity of the joint contained a small quantity of purulent matter. The head of the humerus was extensively carious, and the articular cartilages were almost completely destroyed by ulceration. On making incisions into the sloughy and disorganized walls of the cavity surrounding the joint, a quantity of purulent matter could be evacuated from the cut extremities of the veins, which appeared thickened, and they retained their circular form like arteries. On tracing several of these veins with the scalpel, their lining membrane appeared to be thickened and of a leaden colour; but these appearances terminated abruptly at their junction with the trunk of the axillary. Several of the smaller branches were evidently connected with small collections of purulent matter distributed throughout the substance of the muscles.

A quantity of whey-coloured fluid was found in the cavities of the pleura, and also in the peritoneal sac. Purulent deposits, not unlike softened tuberculous matter, were found in both lungs, and several minute branches of the pulmonary veins were filled with purulent matter. Several of these deposits were found in the substance of the spleen. The liver was of a light grayish-yellow colour, and its surface was beautifully variegated with the minute starlike groups of the radicles of the *vena portæ.* The portal vein itself appeared healthy.

The commencement of *phlebitis* in this case may be dated from the 30th July, the patient having had a rigor that day; and this symptom is almost an invariable attendant on the disease. The disease in the cavity of the joint, in all probability, existed previous to the occurrence of *phlebitis*; for the head of the humerus was extensively carious, and the cartilages were destroyed by ulceration.

It is therefore likely that the original injury had first excited inflammatory action, and then ulceration in the joint, and that the veins had ultimately become implicated in the disease.

Fracture of the tibia, fibula, and os calcis. Amputation. Phlebitis.—James Kennedy, aged 34, weaver, was admitted 4th January 1837. He fell, when in a state of intoxication, but was unable to give any account of the way in which the accident occurred. The left ankle-joint was much swollen and discoloured; and both *tibia* and *fibula* at their lower extremities were comminuted, and appeared to be in contact with the articular cavity. The *os calcis* was also fractured. He complained of rather acute pain over the *sacrum*, aggravated by pressure, and he passed urine with difficulty. The limb was placed in the straight position, and was going on pretty well for a day or two; but after that period, erysipelatous inflammation made its appearance in the leg, and was treated with leeches, incisions, &c. internally wine and quinine were exhibited, as his pulse was very feeble, and about 100. The nitrate of silver was applied to the thigh in the form of a ring, and his urine was drawn off by the catheter.

Under this treatment the inflammation of the leg and thigh was greatly diminished; but suppuration had taken place in the neighbourhood of the ankle-joint; a considerable portion of the soft parts had sloughed; and the *os calcis* was laid bare. The pulse was at the same time 120, and feeble; and he had a severe rigor on the 28th January. As there seemed to be no chance of his surviving the irritative fever, occasioned by the extensive suppuration and disorganization of the joint, a consultation was held, and it was agreed, that though his weakness was very great, amputation was the only chance that remained for him.

On the 30th the limb was removed at the lower third of the thigh by the double flap operation. The femoral vein bled rather profusely; but torsion was applied to it successfully.

On the day following the operation, the pulse was 116, and rather stronger; the tongue was moist; and there was no swelling of the stump, and very little bloody discharge from its surface; but the rigors followed by perspiration had not abated; and his bowels were obstinately constipated.

On the 3d of February, the dressings were removed, and there was a scanty discharge of purulent matter; but no swelling or pain of the stump. He had frequent rigors, followed by perspiration during the day. The pulse was 128, feeble; the tongue red and dry; he had frequent vomiting; but the bowels had been freely opened with senna and Epsom salts. He complained of pains in his chest, but it sounded well on percussion. He gradually sunk, and died on the evening of the 6th February.

Sectio cadaveris.—On removing the sternum, the left lung was found slightly adherent to the costal *pleura* by a scanty semi-purulent deposition. Both lungs, especially their inferior lobes, were of denser consistence than usual, and exhibited on their surfaces several protuberances resembling small abscesses; but when incised were found to consist of purulent deposits, having a very soft consistence.

The liver and other abdominal viscera appeared to be sound.

On examining the stump, the soft parts were found covered with a copious purulent secretion. The internal femoral vein was thickened in its coats, imbedded for several inches in disorganized cellular substance, and as far up as the crural arch its internal membrane was of a deep greenish-purple hue, and was coated with flakes of coagulable lymph. A good deal of dissolved grumous blood was found in the upper part of the vein; but no purulent matter was distinctly recognized in it. The superficial veins were apparently healthy.

In this case the principal point worthy of notice is the period when the *phlebitis* commenced. He had rigors for two days before the amputation, and this seems to favour the view that the disease was then commenced; but no diseased veins were found in the amputated leg; and though the femoral vein, when the leg was removed, gaped more widely than what is usual, yet no purulent matter was observed within its cavity. The occurrence of phlebitis might also be explained upon the hypothesis, that the torsion of the vein excited an inflammatory action on its inner coat, in the same way that tying a venous trunk causes the discase. But it is proper to observe, that I have in one or two instances been obliged to employ torsion in order to repress obstinate bleeding from the femoral vein after amputation, in which no unfavourable result ensued.

Even upon the supposition that *phlebitis* had commenced before the amputation, and that it had been detected, the operation might be considered warrantable, provided there were no symptoms indicating purulent deposits in any of the cavities; for in such a generally fatal disease, the operation might be urged with equal propriety, as in spreading gangrene; but of course it would require to be done completely above the line of the inflamed veins.

Erysipelas.—I am induced to notice this disease, on account of its having prevailed epidemically in the wards under my charge; and also with the view of making some observations on the employment of the nitrate of silver in checking erysipelatous inflammation. It is always a most annoying occurrence to the surgeon, and, no doubt, more so to the patient, particularly when it attacks operation cases; for those which might otherwise have gone on favourably, are either much protracted in their cure, or, perhaps, a fatal termination may be the result. In illustration of this remark, several cases may be quoted.

The first case, an unmarried woman, of unhealthy constitution, aged 50, was admitted on the 8th of June 1836. The breast was removed on the 14th, dressed on the 18th, when it was found that adhesion had taken place almost throughout the whole extent of the wound. The following day erysipelatous inflammation appeared around the wound, and it gradually spread over the whole trunk. She died in about a fortnight after the commencement of the disease.

The second case occurred in the person of a woman from the Highlands, aged 55, married, who had been affected with cancer of the mamma for eighteen months, and who was admitted on 9th June 1836. The tumour was very large, extremely hard; and in its centre there was a small fluctuating point, which was slightly excoriated, and the glands of the axilla were extensively diseased.

Her case was submitted to a consultation, but no operation was thought advisable, and she was waiting in the hospital for a day or two, until she could procure a conveyance to take her home, when she was seized with erysipelas, which commenced at the excoriated point already mentioned. The disease spread rapidly over the whole trunk of the body, and she sunk on the fourth day.

In these two cases, the disease occurred at the same period, and there could be no doubt that it occasioned the fatal termination in both instances. A great many other cases occurred about the same time, not only in the female ward, but also in the one adjoining allotted for males, though the wards had been cleaned only a week or two before. In order if possible to get quit of the disease, the wards were again in August very thoroughly cleaned, white-washed, fumigated for two or three days with chlorine gas, heated to as high a temperature as the stove in the house would produce, and finally kept empty for about a month. The disease, notwithstanding these various processes, reappeared in October, and during that month and the following, November, affected almost every patient in the two wards already mentioned. Many of the cases were exceedingly severe, and were attended with high constitutional irritation, but none at this period proved fatal. Several operation cases were attacked with the disease at this time; in two of the cases, the patients were of very unhealthy constitutions. The first was a case of adipose tumour of the forehead, in which the erysipelas commenced around the wound after the first dressing. The second was a case where a tumour, about the size of an orange, was extirpated from the abdominal parietes near the umbilicus. The patient was seized on the day following the operation with the symptoms of the disease, which assumed a very acute type, and the pulse was rapid and feeble. She was treated with wine, almost from the very commencement of the disease, on account of the great prostration of strength from diarrhœa, and the copious discharge of purulent matter from several abscesses that were formed in the neighbourhood of the wound. She was discharged cured in about five weeks after her admission.

In the latter end of January 1837, a lad, about 16 years of age, who was admitted for *necrosis* of the leg and arm, and where a circular piece of necrosed bone, about 2½ inches long, had been extracted from the tibia, was seized with the disease in about eight days after the operation. The disease made its first appearance in the knee, and spread rapidly upwards to the groin; pulse 130, feeble, and he had frequent vomiting. An abscess took place on the dorsum of the foot, which was opened, and the knee-joint became much swollen on both sides of the patella, attended with a throbbing pain. It was evident that purulent matter had collected in the joint; but as making a free opening into it would have most probably increased the constitutional irritation, the following method of treatment was adopted. A grooved needle, about a line in diameter, was introduced into the most prominent part of the swelling, on the inner side of the joint, which gave exit to a sero-purulent fluid. A cupping-glass was now applied over the puncture, and about three ounces of the same fluid were evacuated. The wound was found completely closed next day, and the same operation was repeated every successive day, for a few days, with the evacuation of from one to two ounces of fluid each time. He left the hospital in about a week afterwards, his limb being nearly restored to its former state, with the exception of the knee, which was still somewhat swollen.

This plan of using the grooved needle and cupping-glass might be advantageously employed, not only in evacuating collections of matter in joints, but also in some chronic abscesses, where high constitutional irritation is apt to follow a free incision.

In March, the disease attacked two rather important cases. The first was a case of most extensive bad sores, the result of typhous fever, which were cicatrizing with great rapidity under the endermic application of the sulphate of quinine. The first ulcer was situated on the upper part of hip, was about two inches and a half in diameter, having a circular form; and about one inch and a half deep, with a large slough partially detached. The second ulcer was situated behind the trochanter, was about the breadth of the palm of the hand, and about half an inch deep, with a large slough attached to its central part. The third was situated over the scapula, very deep, at its posterior margin, exposing a considerable portion of the costa of the scapula, and was about four inches in diameter. The patient was very weak, with a feeble pulse at 100. She was treated with wine, nourishing diet, and sulphate of quinine internally, for the first ten days; but after that period, ten grains of it were sprinkled upon the ulcers every second day. It produced some pain on its application, and some increase of suppuration; but under its employment in this way, and emollient poultices, the ulcers had cicatrized to about half of their original size in about a month; when she was seized with erysipelas, which commenced around the ulcers situated near the hip-joint; but its progress upwards and downwards seemed to be checked by two rings of the nitrate of silver, the one formed around the trunk, on a line with the lower termination of the sternum, and the other around the thigh at the groin. She left the house in a short time afterwards with the ulcers nearly in the same state as when the erysipelas commenced.

An operation case, also of some interest, was about the same time attacked with erysipelas. M. Gibson, servant, aged 28, was admitted for aneurism at the bend of the arm, the result of bloodletting for influenza, about seven weeks before her admission. Very great swelling and tension of the arm was almost the immediate result of the phlebotomy; but when she presented herself at the Infirmary, it had become partially circumscribed. There was a large ill-defined and slightly elastic tumour at the bend of the elbow, and extending as high up as the middle of the humerus. Pulsation could not be distinctly detected in the tumour, and the original lancet puncture remained patent, and its edges were elevated and callous. Two days before her admission, six ounces of florid blood were discharged from the original puncture, and a smaller quantity was discharged the first night she passed in the house. The general health was good previous to her attack of influenza. The pulse was 92, weak at the radial artery of the affected arm.

At a consultation to which the case was submitted, it was unanimously agreed, that the brachial artery should be tied immediately above the tumour. The operation was accordingly performed on 29th March 1837, by making an incision, about two inches in length, along the inner margin of the *biceps*, immediately above the aneurismal sac. The artery was with very little difficulty found and secured by a single ligature. On the 30th, of March the heat of the arm and fingers was natural; no pulsation was perceptible at the wrist, in the radial artery; the pulse was 112, rather small, and the tongue white. Next day the swelling and tension at the elbow was considerably diminished, with very little attendant pain; but she had been affected with severe pain in the epigastric region, with some tenderness on pressure over the whole abdomen; the bowels were open; no vomiting; the tongue was red, but moist. She was ordered castor oil containing four grains of calomel, and bleeding to the extent of twenty ounces. She had, however, been so much frightened by the former result of phlebotomy, that she would rather have left the hospital than submitted to it. As a substitute leeches were applied to the abdomen, and she was treated with one grain of calomel and one-quarter of a grain of opium every six hours, in the form of pill.

This treatment had the effect of relieving the pain of the abdomen; but she was again attacked with it on 1st of April; and it was again relieved by a blister, and a dose of castor oil and calomel, with a continuance of the pills. On the 9th of April, the swelling had greatly diminished; considerable discharge of healthy purulent matter took place from the operation wound; the ligature was still adherent; the pulse 112, moderate; the tongue reddish, some tenderness of epigastrum, with inclination to vomit, and the mouth mercurialized. On the day following erysipelatous rednessand swelling appeared around the elbow joint, with increased swelling. The calomel and opium were omitted, and around the arm, near the axilla, a ring was made with solid nitrate of silver to the breadth of an inch, which next day was wholly vesicated.

Numerous punctures were made in the inflamed parts, which bled freely, but on the 12th the arm was much more inflamed and swollen, though neither had extended beyond the ring formed by the nitrate of silver. The ligature was detached at this date. Three incisions, each about an inch and a-half long, were made through the skin and cellular tissue, on the external aspect of the arm and fore-arm, which bled freely, and a free opening was made into the aneurismal sac, from which issued a considerable quantity of coagulated blood, mixed with purulent matter. At this time the pulse was 116, and the tongue red; but there was less pain in the epigastrium. Fomentations to the arm were ordered, and a few ounces of wine internally, as her pulse was rather feeble. Con-

siderable quantities of coagulated blood and purulent matter continued to be discharged from the aneurismal sac for several days, an abscess formed on the outer aspect of the arm, a little above the *olecranon*, which being opened, several ounces of healthy purulent matter were evacuated. After this the swelling was diminished, and though the erysipelas had not extended beyond the caustic line, there was still extensive suppuration, with copious discharge of purulent matter; pulse 120, feeble; tongue chopped; pain in the epigastrium increased towards evening, and there was a tendency to diarrhœa. She was treated with six ounces of wine, arrow-root, gruel, blisters to the epigastrium, and a draught of solution of muriate of morphia at bed-time.

On the 24th of April she was affected with rigors, followed by perspirations; increased pain of the epigastrium; and slightly laborious breathing, the pulse was 124, feeble; and the tongue red and dry; the swelling and suppuration of the arm being rather less. These symptoms gradually became worse, and she sunk on the 28th, about a month after the operation.

Sectio cadaveris.—The viscera of the thorax and abdomen were carefully examined, but nothing unnatural was found in the former cavity.

The stomach exhibited no morbid alteration of structure, not even vascularity of its villous coat. The lower half of the ileum and superior third of the colon were unusually vascular. The aggregate glands were distinctly visible at the termination of the ileum, and in the cœcum, as well as in the superior third of the large intestines, were seen small elevated ulcers about the size of split peas, sparingly scattered over its mucous surface.

The pelvic viscera were sound.

An incision was made in the right arm from the upper part of the humerus to wrist, laying open the aneurismal sac. The sac was about six inches in length, by two and a half in breadth. Internally it had a dark greenish-yellow colour, and was covered with a yellowish consistent purulent matter. Its walls were exceedingly firm, and the cellular texture along the whole of the upper extremity was very much thickened, and in the immediate vicinity of the vessels and nerves, which were firmly matted together, a quantity of semitransparent gelatinous-looking matter appeared to be infiltrated into its texture, and exuded from it on pressure. The artery, at the place where it had been taken up, was found degenerated into a ligamentous-looking cord for about three-fourths of an inch, and was with difficulty disengaged from the dense matting of the surrounding parts. The radial artery at the wrist was quite patent, and both the arterial branches and veins of the arm were quite healthy internally.

In this case the fatal termination may chiefly be attributed to the attack of erysipelas, for the diminution of the aneurismal tumour was going on most favourably till that period. The symptoms indicated some abdominal inflammation; but the dissection shows that this had only existed to a small extent, and not by any means to the extent generally found in fatal *peritonitis*. Ulcerated patches, indeed, were found in the intestines; and though these alone could hardly account for the result, yet if taken in connection with the profuse suppuration from the arm, and the consequent constitutional irritation resulting from both, may satisfactorily account for the ultimate sinking of the patient.

In the general treatment of erysipelas, the antiphlogistic plan was only employed in a few cases in the commencement of the disease; for it was found that symptoms of debility in general appeared pretty early, more especially if diarrhœa was a concomitant, which was not unfrequent. The tonic plan was, therefore, found the most successful, and it consisted of wine, sulphate of quinine, light nourishing diet suited to the state of the digestive organs, laxatives or laxative enemata, and occasionally opiates at bed-time. The external treatment consisted of leeches, punctures, incisions, mercurial ointment, nitrate of silver applied in the form of a weak solution to the whole erysipelatous surfaces, or applied in the solid state in the form of a circle, with the intention of insulating the disease.

Leeches and punctures were not found so beneficial as incisions; and the latter were generally practised, and made in various parts of the region affected, to the extent of from one inch and a half to two inches and a-half in length, through the skin and cellular texture. In the slighter cases, where the disease appeared to be superficial, mercurial ointment, and a solution of nitrate of silver, consisting of ten grains to an ounce of water, were applied; but the latter was found the most efficacious of the two; and generally, on the day following its application, the swelling and redness were much diminished.

The solid nitrate of silver succeeded in the great majority of cases, in preventing the spreading of erysipelas; and the following points require to be attended to, in order to insure success. *1st*, It must be applied to a sound part of the integuments, viz. a part where there is no swelling or redness; but as near as possible, so as to avoid this. *2d*, The inflamed surface must be completely encircled by the caustic line. This may be effected in the following way. Take a pretty large hair-brush and moisten thoroughly with water the part that has been selected to the breadth of about an inch; then rub a cylinder of lunar caustic very freely over this moistened portion of the skin. Distinct vesication over the whole surface to which the caustic has been applied should be produced; for if this does not follow, the disease may extend beyond the line. And this is perhaps the reason why a saturated solution (consisting of equal parts of the salt and water) is not so certain as the solid caustic; for erysipelas seems to extend its boundaries by creeping along the cutaneous surface, before it affects the cellular tissue; hence if its progress over the integuments can be checked its extension in the textures below will at the same time be prevented. In general, after the caustic has been thus applied, the inflamed integuments in the immediate vicinity of it become partially shrunk and puckered; but the state of the previously affected parts appears to be uninfluenced by it, and they proceed to resolution or suppuration, according to the nature of the case. Many cases could be quoted from the journals of the house, besides those already noticed, where this practice was adopted, in proof of the general efficacy of this mode of insulating erysipelatous inflammation; but their introduction would render this report too long.

A question of much practical importance relates to the causes of erysipelas, in as much as the prevention of the disease, and the separation of those affected with it from other patients, depend partly upon the opinions formed respecting this subject. I shall not attempt to discuss the contagious or non-contagious nature of the disease; or whether it can be generated by overcrowding a ward, and by want of cleanliness and ventilation; but simply state that, on two or three occasions, almost the whole patients of a particular ward have been affected with the disease in rapid succession; the first case, being generally a solitary instance, either occurring in the house, or brought to it when labouring under the disease. It has been further found, that, for several years back, the disease has only prevailed, to an epidemic extent, in two particular wards, both situate at the top of the house, and consequently better ventilated than those situate below them. It has already been stated in this report, that these two wards were cleaned out, ventilated, fumigated and heated with very considerable care; and that, notwithstanding, the disease, in a short time afterwards, reappeared. Overcrowding was not the cause, when on this occasion the disease first returned; though at some other periods the wards were very full, owing to the numerous important cases that presented themselves for admission. Whether it be possible that the disease may be spread in consequence of the promiscuous use of sponges, towels, &c. I am not prepared to give any positive opinion; but certainly, as long as there is any doubt respecting this point, precautionary measures for preventing this should undoubtedly be adopted.

The conclusions, therefore, which may be drawn from these statements, are

1st, That there should be a ward, in every large hospital, exclusively set a part for erysipelatous cases; and the reasons for adopting this plan are at least equally strong, as for the separation of fever from other cases.

2d, That every erysipelatous case should on admission be sent to this particular ward.

3d, That all cases occurring in the hospital, where removal would not be injurious, should be sent to this erysipelatous ward as soon as the disease is discovered.

ART. III.—*A Selection of Cases presenting aggravated and irregular forms of Hysteria; and an analysis of their phenomena.* No. I.—*Hysterical Ischuria.* By THOMAS LAYCOCK, House-Surgeon to the York County Hospital.

The aggravated forms of hysteria always present matter for curious speculation. The most prominent symptoms in such cases are usually those which indicate direct derangement of the functions of the nervous system. Sanguineous discharges, and, more rarely, vomiting of a urinous fluid with suppression of the renal secretion, have also been noticed as striking symptoms. Two cases resembling the latter class have occurred in the York County Hospital; and I am induced to publish as condensed a history of them as possible, not only on account of their singularity, but because of their remarkable resemblance both to each other, and to several cases detailed by various authors. An analysis of the most authentic of these I have subjoined.

1. H. O. a female, aged about 16 years, was admitted into the York County Hospital, under the care of Dr Belcombe, on the 7th of October 1836, for symptoms of diseased spine. She was of low stature, had a plump face, rather florid complexion, blue eyes, round, well-developed, arms and legs, and large mammæ; the nipples also a little enlarged, with dark-brown areolæ. She complained of sleeplessness, pain in the head, dimness of sight, (for which she wore semi-convex glasses,) loss of muscular power, so that she was unable to walk, pain and œdema of the inferior extremities, and pain and tenderness in the back, which presented, in the inferior dorsal region, scars, as of old issues. She had a constant short cough, as if caused by irritation in the pharynx, with an expectoration of a whitish frothy fluid in small quantities. The pulse was slightly quickened, the skin natural. She had also loss of appetite, and pain in the right hypochondrium. The abdomen was knotty, much enlarged, tympanitic, and very painful on the slightest touch. The navel formed a *cul de sac*, about an inch in depth, the bottom of which could be seen with difficulty. There was discharged from it a fluid, which tinged the linen of a light-red colour, and deposited upon it a small florid red coagulum. A similar fluid

was discharged from the ears. The bowels were constipated, and stated to have been so for two or three days. The patient was unable to pass her urine, and had not done so for more than thirty-six hours. Dr B. ordered the catheter to be passed immediately, and five or six ounces of healthy urine flowed. The catamenia were regular, and had appeared a few days previously to admission.

I ascertained from the patient and her mother, that she menstruated at the age of ten years, when she suffered a long confinement from an attack of typhous fever. She, however, recovered moderate health, though always complaining of pain in the back. From July 1835 until December following, she had loss of appetite and debility, and scaly spots on her legs. She then recovered, but on the 5th of March 1836 was affected with pains in the teeth, head, between her shoulders, and in her side. Soon after she had pains in the dorsal region of the spine, pulsation in the throat, and great difficulty of breathing. So urgent was the latter symptom, that she breathed convulsively, and suffocation was often feared. She had a short harassing cough with bloody expectoration, her sight was nearly lost, and she became incapable of moving, so that she was altogether confined to bed. Her abdomen at this time was much swollen; she passed urine in small quantities and with great difficulty; sometimes three or four days elapsed without any evacuation, but after one long period of retention, she passed three or four quarts of urine. Her bowels were very obstinate, requiring the most drastic purgatives and enemata to move them. Her navel discharged a bloody fluid, which fermented like yeast, and ran down the abdomen. Her ears also discharged a reddish fluid, having a faint urinous smell.

These various discharges continued until August, when they ceased, except that from the ears. The difficulty of breathing and cough were also much alleviated, but at this period she began to vomit a fluid, which tasted salt, and smelt like urine. On the first vomiting of this sort, the fluid gushed from her mouth suddenly, and in large quantities. A neighbour, upon duly inspecting the fluid thus evacuated, pronounced it to be "certainly her water." This occurred frequently afterwards, but not regularly, her urine by the natural passages being scanty or altogether suppressed. The bloody discharge from the navel recommenced in September, and continued until her admission into the hospital. Upon inquiry of her former medical attendant I found there was some slight, but no very material difference between the statements made to himself and me. He also had the goodness to inquire of the neighbours who had witnessed the urinous vomiting, and informed me that they corroborated the facts already detailed. He considered her a deceitful, obstinate girl. His treatment consisted principally in counter-irritants to the painful portion of the spine, purgatives, and the use of the catheter. Tartar emetic produced ulcers on the back, which healed with difficulty, and left the scars already described. Her diet during the whole of this period was farinaceous ; animal food was always disagreeable ; but beef during her illness was the most obnoxious, and the smallest portion would frequently cause urgent vomiting and distress.

The sonorous grating cough continued night and day, for three or four days after her admission, but disappeared when severe measures for its cure were talked of in her hearing. As no urine passed spontaneously, the catheter was used daily, and small quantities drawn off. In a few days it became of a deep red colour : and shortly after a frequent, hacking cough came on, and an expectoration of a bloody fluid, amounting in quantity to several ounces daily. The ears and navel discharged about an ounce each during the same period, and continued to do so until December 18th, when they ceased. The bloody urine was observed for a month only. From the period of admission to the 12th of December the symptoms were headach, sleeplessness, dimness of sight, pain and tenderness of the back, arms and loins ; paroxysms of dyspnœa, cough, quick pulse ; anorexia ; frequent vomiting ; knotty, tumid, tympanitic abdomen, very painful on pressure ; most obstinate constipation ; and constant retention and diminished secretion of urine. The catamenia were regular.

Various remedies were tried without producing any apparent benefit. Warm baths invariably aggravated the symptoms. Every species of narcotic failed to procure rest. Leeches were repeatedly applied to the abdomen, behind the ears, and to the temples with only temporary relief. Once, at the suggestion of Dr Wake, four ounces of blood were drawn from the arm with the effect of inducing syncope during the operation, and active delirium and sleeplessness at night. The blood did not flow in a jet, and, after standing, presented the appearance of a soft coagulum, having a gelatinous appearance and no buff or serum. Its surface was of a bright red colour. Tonics were equally as inefficacious as depletory measures. The mineral and citric acids, wine, quinine, and other bitters, and strongly saline acidulated solutions had no effect,—with this exception, that the latter proved a very active purgative, when croton oil, turpentine, colocynth, scammony, and aloetic and other drastic purgatives, and enemata, failed to open the bowels. Next to the saline solution, croton oil given in two minim doses, every six hours, with yolk of egg, was the most effectual. The most efficacious hypnotic was composed of six grains of camphor, four of extract of hemlock, and four of extract of henbane, made into pills, and given at bedtime. When the bleeding ceased from the navel the abdomen was less tender.

From the end of December 1836 to the end of February 1837, assafœtida, aloes, and extract of henbane in combination, opium frequently repeated, creosote, hydrocyanic acid, bark, and other remedies, were given, with the constant use of drastic purgatives and enemata; with what effect the following note from my case-book will show.

February 24, (1837.)—During the whole period of the last eleven weeks, the symptoms have varied little, the bowels have been obstinately constipated, never being moved without the use of the most active purgatives and enemata, and the alvine evacuations obtained by these have been invariably scanty. During an equal period less than a teaspoonful of urine daily has been drawn from the bladder by the catheter. At intervals, varying in length from seven to ten days, three or four ounces of a urinous fluid have been vomited. The appetite has been variable, most usually wanting. Sleep could only be obtained by the constant use of narcotics, and many nights together are stated to have been sleepless. Laudanum, in two doses from 20 to 120 minims, procured rest; when the latter quantity was given, active delirium, continuing for three or four hours, was excited. In addition to her usual symptoms she complains of pain in the head and chest: The abdomen is tympanitic, and there is an obscure fluctuation. During the last three weeks there has been bloody discharge from the ears only.

Notwithstanding all these sufferings, the body is still as fat, and the arms, hips, legs, and mammæ as plump, as when the patient entered the hospital.

On the 26th and 27th of this month the patient menstruated. On March 2d, the discharge from the ears ceased, and she complained of profuse perspiration between the shoulders and hips, making the sheet and her shift quite wet.

Up to this period little attention had been paid to the reports of the nurse respecting the urinous matter vomited. That usually shown seemed to be the half-digested contents of the stomach, having a urinous smell, and seldom of so thin a consistence as spoon-meat. The following occurrence arrested my attention at once.

March 9.—A fluid was shown to me this morning, which it was said H. O. had vomited during the night. It is nearly limpid, of a pale straw-colour, has no smell, but when heated gives off a very strongly urinous odour. About ten o'clock this morning, in the presence of the nurse, she vomited a farther quantity of fluid, having all the properties of urine freshly discharged. There could be no doubt of its being pure urine."

This was the first open attempt at an imposition which was carried on during the following three months with an obstinacy and cunning never surpassed, and scarcely ever equalled.

In the first instance, I was convinced that the vomiting of such a fluid was impossible. The perusal of the cases hereafter to be detailed led me to modify my first impressions, and determined me to commence a close investigation of the symptoms. On the evening of this date she was removed into a private ward, and a system of inspection commenced, which was gradually made more strict, and ultimately unravelled the peculiarities of the case to a considerable extent.

From the 4th to the 22d of March, the daily quantity of urine reported to have been vomited varied from twenty to forty ounces. It was occasionally precisely like healthy urine, sometimes mixed with food, and sometimes blood-coloured, when it had a peculiarly faint smell, which resembled the washings of slightly tainted meat. It coagulated by heat and nitric acid. About six ounces of a fluid resembling saliva mixed with blood flowed once from her mouth. On the 22d the navel was found full of a thick sanguineo-purulent fluid, smelling like placenta. Little or no urine was found in the bladder when the catheter was introduced. She frequently declined having the instrument used, because she was "sore." For some days she complained of pain in the left shoulder, and pain and inability to move the arm of that side, which hung as if paralysed. She had sleepless nights, and pain in the head and back. On the 4th, her bowels were moved without an enema for the first time during eight weeks. Her abdomen was exceedingly tense: measured round the abdomen, it was thirty-one inches and a half in circumference, that of a stout healthy girl, measured at the same time, was twenty-six inches and a-half. It was also very painful, and on one occasion, she having fainted, a line of tumours was observed in the right iliac region. These were of the size of a nut, and painful on pressure. Her pulse varied between 88 and 148, sinking and rising rapidly in a few seconds. Twelve leeches were applied to the abdomen, and bled rather profusely: the bleeding was followed by violent pain in the head, and increased action of the heart; pulse 138; syncope, delirium, and jactitation followed. There was extensive ecchymosis round the leech-bites. On the afternoon of the same day I resolved to sit with her and watch her vomit. So soon as she ascertained my intention, she became very restless, twisting herself about as though she had the colic. She said that she vomited soonest when upon her back, and accordingly she placed herself in that position. I sat with her for two hours, and then called for the catheter. During the moment I turned my back upon her for this purpose, she sat up in the bed, and when I looked round I observed her putting urine out of her mouth. Some of this I gave to Mr Stott, an intelligent pupil of the hospital, who satisfactorily ascertained that it contained urea, a small portion of albumen, sulphates, muriates, and phosphates, lime, magnesia, and ammonia. On the 18th she again discharged urine from her mouth.

Up to this period nothing had occurred in the conduct of the patient to excite any suspicion of deception on her part. She seemed a quiet, inoffensive, and exceedingly reserved female, patiently submitting to every remedial measure. But the vomiting of pure urine in such large quantities was enough to excite distrust; and on the 22d, with a view to ascertain whether there were urine in the stomach, Dr Belcombe ordered an emetic to be given. In about half an hour after its administration, vomiting commenced, and a clear amber-coloured fluid was shown as having been brought up. It had mucus floating on it, and contained a large quantity of urea. The superintendence of the operation of the emetic was left to the nurse, upon whom, I have since satisfied myself, full reliance could not be placed. I resolved, however, to seize the opportunity now afforded for a more strict investigation, and soon after the vomiting had ceased, I commenced a close watch, which I continued, by the kind assistance of Mr Evans, a senior pupil of the hospital, during thirty successive hours. Every precaution was taken to prevent deception, and she was not left alone for a moment. During this period she complained of pain, giddiness, and throbbing in the head, and twitchings in the legs. A drachm of laudanum was given at bed-time, but only produced general restlessness and increased pain in the head, hypochondrium, and hypogastrium. She had a short frequent cough, the sound of which seemed to come from the pharynx, and occasionally spit out a bloody fluid, frothy, and evidently obtained by sucking her gums. It differed altogether from the fluid expectorated on former occasions. Round the umbilicus she had pain increased on pressure. The abdomen had the usual appearance. At the tenth hour of the watch I found the bladder somewhat distended, and after repeated attempts on the part of the patient to prevent me, I succeeded in introducing the catheter, through which eight ounces of urine flowed. Thirteen hours after, by request of Dr Belcombe, I again attempted the operation, but did not succeed. At the thirtieth hour Dr Belcombe again visited her. The bladder formed a large tumour in the epigastrium. The catheter was introduced at the first attempt, and twenty-nine ounces of urine were drawn off. She did not sleep during the whole period, and took nothing except an egg, a glass of ale, a few ounces of weak wine and water, and a cup of coffee.

The absence of the sanguineous discharges, and of the suppression and vomiting of urine during so long a time, might probably be considered by some as decidedly proving their non-existence, during the *past* period. But I had satisfied myself that the first class of symptoms did really exist, and the same causes which operated their absence might have operated the secretion of urine. Besides, I had already ascertained that urine did really come out of her mouth: the question to be decided was,—how it got there?

The morning following the watch, I again saw her put out of her mouth a yellow looking strongly ammoniacal fluid, resembling urine, which had been kept in a warm place for a day or two. She was then removed into an inner ward, from which every utensil was removed except a hand bell. In the evening the nurse stated that she had vomited urine five times during the day; the whole quantity vomited amounted to nine ounces. At ten o'clock I again commenced a watch. Finding a tumour in the hypogastrium, I introduced the catheter, expecting the bladder was full. To my great surprise, however, no more than half an ounce of urine flowed. I repeatedly introduced the catheter, and took especial care to ascertain that it entered the bladder, but no more urine flowed. Three hours and a half after, she complained of pain and desire to make water. I drew off six drachms of urine. Having occasion, immediately after, to leave her for some medicine, I removed every utensil from the ward, (except the bell,) and fastened her in it. I returned in three or four minutes, and found her with her mouth full of the usual urinous fluid, which she immediately put out. I am at a loss to say whence it came, but have little doubt of a deception having been practised.

On the same morning, after a short absence, I recommenced my watch, and, with the kind assistance of Mr Evans, continued it for thirty-three hours. Minutes of the symptoms were taken during this, as well as the former watches, at short intervals.

At various periods she complained of pain, heat, and pulsation in different parts;—in the head, ears, middle of sternum, the left breast;—the pain running thence down her right arm, back, hips, &c. She slept for three hours, waking at short intervals. She took no food, and but a few small sips of coffee or water; the latter she said tasted salt. The tongue was usually white. The finger acquired a peculiarly offensive smell while within her mouth, resembling that of the vaginal discharge after parturition, mixed with a rotten herring-like smell. A piece of brown paper which had been chewed, and had a similar smell, was found in her bed. It had a pudendal hair with it. She said she had chewed it to take the nasty taste out of her mouth. Mr Evans and myself called in a patient and the nurse, to assist her in putting on a clean shift, and left her for a moment; so soon as our backs were turned she motioned for the spittoon, and put into it from her mouth half an ounce of a urinous fluid similar to the last-mentioned. I am at a loss to say whence she obtained this. There was nothing observed to lead to the suspicion that it was transferred from the bladder to her mouth, except by means of the chewed paper. But from subsequent observations, it was ascertained that she was unable to pass her urine. The catheter was introduced a few hours after, and twenty ounces of urine drawn off. An emetic was then administered by direction of Dr Belcombe. Nothing but fluid was vomited, which had not the slightest urinous taint. Shortly after, her bowels were moved for the first time during eleven days. The stool was composed of soft feces, mixed with hard dry scybala resembling flattened nutmegs both in size and shape. From the 27th of March to 6th of April, she was left to the care of the nurse only. The hand bell was found to have a urinous smell, and was removed. Urine was said to be vomited. This differed from that drawn off at the same time by the catheter, in having no precipitate when kept for some time. The bowels were kept soluble, by frequently repeated doses of camphor, and extract of colocynth, in combination. The other symptoms were unchanged.

On the 3d April, the navel, and on the 5th, the ears began to discharge the usual red fluid, but less florid. I washed the ears and navel carefully, and examined them closely, but could detect no orifice or mark of any kind. The meatus of the former was abundantly supplied with cerumen. She also began to expectorate a reddish fluid, and her feet swelled a little.

On the 6th of April, her legs and body were inclosed in a calico sac as high as the waist, which was so put on that it could not be moved in the slightest degree without my knowledge. It covered the navel. Its use was continued until the evening of the 10th. During this period, the ears and navel discharged more profusely than ever; she seemed much indisposed; complained of pain and beating in the head and ears, especially when the latter discharged most profusely. Occasionally the left ear only discharged. The short frequent cough and bloody expectoration also returned. She required the daily use of the catheter, which invariably caused her pain. The urine was sometimes natural in quantity, but most frequently scanty, and occasionally had a muco-purulent deposit. Her mouth had the remarkable taint already noticed. The tongue was tremulous; the pulse accelerated. She frequently had a sensation as if pins were running into various parts of her body. The abdomen was less tense, and gave an obscure feeling of fluctuation. The navel had all along formed a fossa or pit, constituted apparently by the œdematous integuments of the abdomen. As the usual discharge flowed more profusely, I was able to collect two or three ounces of it. At this period her nurse was removed, and her place supplied by one in whom I had complete confidence.

On the 14th of April, there was great difficulty in drawing off the urine; the catheter becoming repeatedly obstructed by an adhesive white curdy substance. There was not more than three ounces of urine in the bladder. She had also great dyspnœa and palpitation, and pain below the umbilicus.

On the 15th, when Dr B. visited her, he found the navel full of a fluid, which I will call No. 2. It differed from that usually discharged (No. 1,) in being of a rich red-colour, not glairy or ropy, having no coagula floating in it, and very nearly resembling the fluid discharged when she was admitted. Dr B. and myself examined the fossa containing it very minutely, dilating it, so that the floor might be distinctly explored. Nothing was observed except a small, indistinct point, and a crevice. The sharp point of a probe would pass into neither. On the 16th and 17th she said she menstruated. This statement the nurse corroborated. The fluids, No. 1 and 2, will be noticed again. On the 18th, it was observed that the fluid No. 1 was again discharged from the navel, and had a remarkably offensive smell, somewhat like the feces of an unhealthy child. It also became much more glairy, and contained a large quantity of coagula.

April 20. 10 A. M. The navel discharges as before, but there is not quite so much solid matter. The abdomen at a point an inch to the left of the umbilicus is very painful to the touch; the ears have not discharged; she had rigors, followed by increased heat, and other feverish symptoms during the night.

10 P. M. She fainted this morning; the pulse is 112; the skin is hot; the navel has discharged the fluid as mentioned in the morning; the bowels are constipated. To take fifteen grains of Dover's powder, and have a common enema.

21. Half-past seven A. M. I was called to see H. O. at two o'clock this morning. She seemed in excruciating agony. The pain was described as being of a spasmodic character, and situate a little to the left and above the umbilicus, where there was a perceptible tumour. The navel discharged so much about an hour before the attack, that the fluid ran down the sides of the abdomen. The pain was aggravated at short intervals, when she grasped the bed-clothes and uttered subdued cries, expressive of great suffering. Hot fomentations, sulphuric ether, and ammonia were found to be of no service. I ordered her to take two-thirds of a grain of opium, and four grains and a-half of camphor, every half-hour, until relieved. At present there is no relief afforded, although she has taken six grains of opium, and thirty-six of camphor. The pulse is not quickened, yet the nurse is quite positive she has taken the whole of the medicine.

This state of excitement continued until the 24th. No urine was vomited. The average quantity drawn off by the catheter daily was four ounces. The navel discharged once or twice a clear fluid like water. The ears discharged the usual red fluid, and a bloody fluid was vomited. At this period the pulse ranged between 96 and 160 or 170 beats per minute; the tongue was tremulous, and coated with a yellow fur, with red points; the nights were sleepless; and sometimes not a morsel of food was taken during the whole day; yet she looked as plump, fat, and fair as ever. Leeches applied to the sternum produced extensive ecchymosis.

No one had access to the patient but the nurse. She was locked up whenever the nurse was absent during the day, and the bed of the latter was in an adjoining room. I have no doubt of the truth of this nurse's statements.

On the 25th, for the first time during a considerable period, a urinous fluid was shown by the patient as that which she had vomited. At this date the nurse missed the catheter, which she usually kept in her own possession. The patient's pulse rose to 180, and she had severe febrile symptoms. On the fifth day, a papular eruption appeared on the abdomen, left arm, sternum, and left side of the right breast. On the sixth it appeared on the face; the eyelids and face generally were swollen. On the seventh day the papulæ became confluent, and were interspersed with a few small pustules. On the ninth the eruption desquamated. The febrile symptoms were relieved on the appearance of the eruption; the usual discharges were scarcely perceptible on the first and second day, and then disappeared. From the 4th to the 16th of May little change was observed in the symptoms. The sanguineous discharges returned. She frequently professed still to vomit a urinous fluid, but these vomitings never occurred in presence of the nurse.

On the 16th of May, Dr Belcombe approved of my suggestion that the catheter should no longer be used.

It was then repeatedly observed that the bladder became distended, and most unaccountably subsided. The nurse discovered pillows, a bath cloak, and other articles soaked with urine; and on the 19th, after a minute search, I found the missing catheter in one of her pillows. This was immediately removed without her knowledge, and on the 23d the pain of a distended bladder and fear for its consequences, compelled her to confess that at least, on one occasion, she had drunk the urine she had vomited for the purpose of deception; that she frequently (more than six times, not twelve times,) after having passed the catheter for herself, had mixed the urine with the food she had vomited, or asserted that she had vomited it as it was; and also, that she could not make water. Being questioned with regard to some of the special instances of vomiting of urine before-mentioned, nothing positive could be elicited. That which she stated at one moment she contradicted the next. In general she asserted that the fluids proceeded from the stomach. Her information respecting the instances which occurred while at home was equally vague. She said she vomited a quantity of clear water—a something which tasted sometimes salt, and sometimes sour; but she did not know it was her urine; but that "they," meaning her mother and neighbours, "said it was." I took some pains in noticing the conduct of the mother, and am of opinion she was not accessary to her daughter's practices.

The catheter was introduced into the bladder, and sixteen ounces of urine drawn off. From the 19th to this date (23d) she passed no urine in any way; and only one small hard stool. The strictest precautions were taken to prevent any deception.

From the 23d of May to the 7th of June, H. O. evidently improved. The bowels were moved two or three times a day; the stools were liquid, and contained urine. She denied being able to pass urine by the urethra, or if she did, she was not aware of it. Her abdomen gradually became softer and smaller; she ceased to vomit, and eat her usual farinaceous food freely. The ears and navel continued to discharge the fluid, No. 1, and two or three small portions of bony matter were found in the external auditory meatus of the left ear. She occasionally passed her urine in bed.

Her back was carefully examined, and there was observed an extensive curvature in the dorsal region. A hot sponge passed along the spine, felt hottest (she said) at a point corresponding to the eleventh and twelfth dorsal vertebræ. These were tender to the touch.

She was dismissed on the 7th of June, on the morning of which day she passed two ounces of urine spontaneously. Her tonsils were still as large as they had been during her stay in the hospital; she could walk, but stooped considerably; appearing a diminutive crooked girl. She had been confined to bed during the greater part of the time she was in the hospital (a period of eight months,) and entirely so during April and May; and confined also in a ward alone, no patients being allowed to visit her.

On the 17th of June, her mother informed me that her daughter passed her urine involuntarily as she lay in bed, and that the pudenda and thighs were excoriated by it. She was able to empty the bladder when she got up to the night-chair. Some weeks after I heard that she had quite recovered.

I ought in this place to give some account of the fluids collected from the navel.

No. 1 was the fluid most usually secreted; it was generally of a dark-red or grumous colour, glairy, and ropy when taken upon the finger, and having dark-brown and whitish *flocculi*, like curdy matter floating in it. Mixed with ten times its quantity of water, the white particles disappeared, and the dark-brown remained suspended in it at different heights in the tube. When allowed to be at rest, the flocculi or coagula sunk, leaving the supernatant fluid

moderately limpid. On the addition of nitric acid, it became opaque and milk-like. It had a peculiarly faint, offensive smell. Inspissated, it showed a crystalline structure. After being kept three months, it gave off a strong odour of sulphuretted hydrogen, and when heated, diffused a highly feculent smell. Nitrate of silver threw down a copious flocculent precipitate, which became of a violet colour when left for a few hours. The colour disappeared on the addition of hydrochloric acid, and part of the precipitate was dissolved. The remainder was a pulverulent powder, insoluble in strong nitric acid. Chloride of barium produced no change. When the fluid was boiled and filtered, a slight cloud was perceptible on the addition of a solution of the chloride, while gently heated a glass rod dipped in hydrochloric acid was held over it. Dense fumes were immediately produced.

Fluid No. 2 was collected only at a period when the patient said she was menstruating. It was of a rich red colour, transparent, without coagula: it abounded in saline matter, and when left to dry, formed beautiful pinnatifid crystals. It had no offensive smell. After being kept three months, it was observed to have become opaque and dark. I deferred the analysis of these fluids, agreeably to the wishes of Mr Tate, the Lecturer on Chemistry, at the York Medical School, who promised me his assistance. A severe indisposition has prevented him fulfilling his intention.

The principal features of this case are the following. Menstruation is said to have taken place at an early age; and it is stated that after long continued ischuria, urine, or a urinous fluid was vomited, and discharged from the ears. Farinaceous food could only be taken in small quantities, and was frequently vomited. Animal food was loathed, and when taken was said to cause great pain and distress. The bowels were constantly constipated, and required the most active cathartics; the urine diminished in quantity, suppressed, or mixed with blood; the epigastrium swollen and painful; tumours in the abdomen, the latter tense and tympanitic, and its integuments œdematous; a sanguineous discharge from the navel and ears; great irregularity in the action of the heart; a loose crasis of the blood; a remarkable proneness to ecchymosis of the skin; enlarged tonsils; distressing dyspnœa, and frequent cough, accompanied by a sanguineous expectoration; general irritability; symptoms of affection of the spine; frequent pains in the head; various derangements of the nervous system, as impaired vision, partial paralysis of one arm, the legs, bowels, and bladder; twitching of the muscles; a sense of formication, and pricking in the skin; delirium; sleeplessness; acute pains in various organs: great tolerance of opium and other narcotics; and a proneness to sudden and easily excited syncope; lastly, not only an absence of emaciation during this long and complicated state of suffering, but also the appearance of remarkable roundness and plumpness of the extremities, trunk, and mammæ.

The next case is less remarkable, but presents some interesting points of resemblance.

2. A. C., a female, aged 13 years, was admitted into the York County Hospital, on the 2d of March 1837, complaining of a frequent sanguineous discharge from the vagina, debility, and pain in the back and abdomen. The latter was enlarged, tense, and tympanitic. She was of small size, having dark eyes, and a complexion resembling that of a Hindo-Briton, and a dark tint round the navel. The areolæ of the nipples were of a brown black colour, and studded with prominent papillæ.

The mother of the patient stated, that in June 1835, her body began to swell, and became painful, and she had pain and difficulty in making water, which was in small quantity, sometimes not amounting to half a pint a day, and was very red, as if mixed with blood. She also spit up a yellowish-red water, and had a teasing cough. In August or September following she had the first appearance of the menses. Her abdomen at that time was very painful, frequently swelling to a great size, and then subsiding. The bowels were exceedingly constipated, and she spit up the bloody water already mentioned; her urine was very red. She continued more or less indisposed with these symptoms during the winter and spring following, frequently complaining of pain in the back, and when passing her urine, which was scanty.

On the 20th of August, she could not pass any urine, and was in great pain. The next day, however, she was able to make a few table-spoonfuls of a red colour. At this time, to use the mother's expression, "a nauseous salt water, of a red colour, and clear, used to come into her mouth." Her abdomen was swelled and tight; she had pain in the back; could not bear stays, but put them on sometimes, when she seemed to have one shoulder higher than the other, and her mother thought her "bow-backed." After this time the menses seemed to return too frequently, as she had a sanguineous discharge two or three times a week. Her appetite was always delicate; and broth constantly made her sick and vomit. She could take small quantities of animal food, but "when the red water came up, the smallest portion made her very sick." She usually took no breakfast, and very little dinner.

She is an assistant in a charitable day school. By the use of active purgatives, leeches to the abdomen, and other remedies, the prominent symptoms were relieved, and she left the hospital.

A pupil saw her a few weeks after, having the abdomen as large as if she were in the last month of pregnancy.

On April 27th, she was readmitted with the symptoms beforementioned. Dr Belcombe prescribed the assafœtida mixture, the use of which relieved the tension of the abdomen; but in a few days she complained of pain in the hypogastrium, and inability to pass her urine. The abdomen became again large and tympanitic. The bowels were constipated after the suppression had continued thirty hours. As the pain was urgent I introduced the catheter, and five or six ounces of urine passed. During the forty-eight hours following, she made only a few tablespoonfuls.

Under these circumstances, on the 4th of May, Dr Belcombe ordered six drachms of spirit of turpentine to be given in the form of draught. Vomiting was excited, and she had one dark ill-formed motion. The tension and swelling of the abdomen subsided, but the urine continued scanty. About this time she began to vomit a "saltish" water, and I directed her to remain in bed. I find the following notes respecting these circumstances in my case-book.

"May 6th. She has vomited four ounces of a dull red colour, and a violet odour, like that observed in the urine of a person who has taken spirit of turpentine. The patient occupying the adjoining bed (a well-conducted female) saw her vomit. Heated in an iron spoon, it smells disgustingly strong of urea and coagulates. The abdomen is large as ever, tympanitic, and tender on pressure. Has the usual red discharge.

May 7th. Has vomited a mouthful or two of a fluid like that vomited yesterday, which she asserts is not urine.

8th. Vomited two ounces of a fluid, similar in all respects to the last, in presence of the nurse. Heated in an iron spoon, it smells disgustingly strong of urea.

9th. Has not vomited the urinous fluid, but one which tastes bitter. Says, "that, shortly after leaving the hospital, her body began to swell, and she vomited a red fluid, like that which came up yesterday."

From this period she recovered rapidly under the use of decoction of aloes, with bitters, and subsequently of the assafœtida mixture.

I obtained crystals resembling those of nitrate of urea from the fluid when recently vomited. A portion I kept with the hope of availing myself of Mr Tate's analytical skill. After keeping it for three months it deposited a dirty-red precipitate. It had a spirituous smell. The supernatant liquor was clear, and when heated, frothed up, and gave off strongly ammoniacal vapours, which formed dense fumes with hydrochloric acid gas. A solution of chloride of barium threw down a copious flocculent precipitate, partly soluble with effervescence in strong nitric acid. A white pulverulent precipitate remained, insoluble in hydrochloric acid. Treated with a solution of nitrate of silver, a white flocculent precipitate was deposited, which became dark in a few minutes. Boiled to the consistence of syrup, the fluid gave off a strongly urinous odour, but no crystals of nitrate of urea could be obtained. There was no doubt of this fluid being urine mixed with some foreign ingredients.

This patient had communication with H. O., and she vomited the urinous fluid, when the circumstances of H. O.'s case were notorious. Hence a well-grounded suspicion of her having practised a similar deception. On the contrary, it ought to stated, that she was a teacher in a school for poor children, attached to the convent at York, (being of the Roman Catholic persuasion,) and was in favour with her employers. She was very anxious to leave the hospital, and return to her employment, in which she took great pleasure. Her spiritual adviser considered her a girl of good conduct and character.

These cases will be best illustrated by a concise detail of those which bear some resemblance to them, and already recorded by authors. It is almost impossible to classify the ever-varying forms of hysteria. Three divisions or classes, however, may be formed, having a certain general resemblance; *1st*, Cases with erratic discharge of urine; *2d*, Cases with sanguineous discharges; *3d*, Cases exhibiting remarkable derangement of the nervous system. In the present paper I shall confine myself to cases of the first class.

The *first series* of this class will be cases in which the erratic discharge of urine was accompanied with well-marked hysterical symptoms.

The *second series* will consist of similar cases, the details of which are less precise, or the symptoms less strongly marked.

The *third series* will be composed of cases in which there was an erratic discharge of urine, with various anomalous symptoms, but particularly with paralysis, usually paraplegic.*

The *total* suppression of the urinary secretion is a fatal disease. Prevost and Dumas, while prosecuting their inquiries respecting the blood, found that animals did not survive the extirpation of their kidneys beyond the fifth day. Professor Mayer of Bonn confirmed these observations. In cases of total suppression of urine observed by Dr Abercrombie,† death took place on the fifth day. Writers in general agree in the speedy fatal termination of this disease.‡ Cases to the contrary are related as being extraordinary exceptions, and it has been supposed, that in such the urine must have escaped by some outlet unobserved.* Life may be maintained for many days by a very small secretion of urine; or the latter may be retained in the pelvis of the kidneys or in the ureters or bladder without causing speedy death; life under these circumstances has been prolonged until the 30th day.† In all cases, then, in which the urinary secretion has been stated to have been absolutely suspended for *months* and even *years*, either a deception has been practised, or there has been an erratic discharge of urine which escaped notice.

---

* In the case of D. Valetto, (Ed. Med. and Surg. Jour. Vol. xlii. xlvi.) the supposed urinous vomiting occurred in a male, and the paraplegia was the result of accidental injury done to the spine. For these reasons it has been omitted. It is nevertheless well calculated to throw light on this curious subject.

† In Ed. Med. and Surg. Jour. Vol. xvii. p. 216.

‡ Aretæus de Causis et Signis Morbor. Acut. Lib. 2. cap. 9. Van Swieten apud Boerhaave, Tom. iii. p. 230. Ed. 2da. Sir H. Halford, Essays and Orations, 2d ed. p. 22, and seq. and others.

Our *fourth series* will consequently consist of cases in which there was a long continued and total suppression of the renal secretion, accompanied with hysterical and anomalous symptoms, but without any obvious erratic discharge of urine.

The *fifth series* is merely a list of references to cases, which most probably ought to be placed in one or other of the preceding. I have not been able to procure the details.

Cases of the first Series.

3. Sig. Koenig, M. D. Lithogenesiæ humanæ Specimen. Bernæ, 1685.

4. Marangoni, Histoire de l'Acad. Royal des Scien. 1715.

5. Dr Senter, Trans. of the Coll. of Physicians in Philadelphia. Vol. i. Philad. 1793.

6. Dr Yeats, the London Med. and Physic. Journ. Vol. xxxi. p. 26. Lond. 1814.

7. Dr Girdlestone. Ibidem, p. 111.

8. Dr Arnold, American Journ. of Med. Sciences, 1828.

Second Series.

9. Marcellus Donatus, Hist. Med. Mirab. Lib. iv. Cap. 27. Mantuæ, 1586.

10. Philos. Transactions, abridg. Vol. xi. p. 376.

11. Vandermonde, in Sauvages, Nosolog. Vol. ii. p. 526.

12. Dr Hastings, Midland Med. and Surg. Reporter, Vol. i.

Third Series.

13. Mr Coley, London Med. and Phys. Journal. Vol. xxx. p. 465.

14. Dr Crampton, Dublin Hospital Reports, Vol. iv.

Fourth Series.

15. Schenk, Lib. iii. Obs. 277. Lug. Bat. 1644.

16. Thom. A. Viega, Comment. ad. Cap. ii. Lib. vi. Galeni, de locis affectis.

17. Zeviani, del Flato Ipocondriaco, p. 157. Veronæ, 1761.

18. Dr Peebles, Edin. Med. and Surg. Journal, Vol. xlvi. p. 153.

Fifth Series.

19. Acta, Nat. Curiosor. Tom. iii. Obs. vi.

---

* Dr Abercrombie, loco citato. Good, Paruria Inops, Study of Med. Vol. iv. Cyclopædia of Pract. Med. Art. Ischuria Renalis, Vol. ii.

† Morgagni. de Sed. et Caus. Morbor. Epist. 41.

20. Acta Eruditor. 1726. Also Acta Petropolitana, i. p. 368.
21. Vallisneri, Ephemer. Natur. Cur. Cent. 9. Obs. 50.
22. Vandermonde, Sauvages' Nosol. Tom. ii. p. 526.
23. Nysten, Journal Gèn. de Mèdecine, Tom. xl.
24. Cheyne, J., M. D. On Apoplexy, &c. p. 207. 1812.
25. Cavalli Carlo, M. D. Storia Ragionata di Straordinaria Malattia, Milan, 1834. Of this case an account is given in Martini's Lezioni di Fisiologia, I think.
26. Lancet, 1832–3, Vol. ii. p. 704.
27. Dr Lyncker, in Casper's Wochenschrift, No. 16; and Medical Gazette, Vol. xx. p. 891.

I. *First Series.*

3. A female, aged 21, was admitted into the hospital at Berne, labouring under pemphigus. The vesicles were the size of a hand, and accompanied with excruciating pains and delirium. The disease yielded to a mercurial course, after being treated by various remedies for eight months. She continued well nine months, at the end of which period the disease again returned, and she was admitted into the hospital a second time. On the 12th day the vesicles disappeared, and on the 20th the patient was seized with pains in the loins, bladder, perinæum, and groins, accompanied by prostration of strength, loss of appetite, suppression of urine, and a quick and irregular pulse. The clysters administered were vomited, together with numerous calculi.

"Although the difficulty of making water was extremely urgent, yet, on introducing the catheter into the bladder, not a drop came away. The catheter stuck there as if it had been glued in. The belly was distended, but not to a great degree, accompanied with oppression of the præcordia, difficulty of breathing, and most acute lancinating pain in the region of the right kidney, and in the left hypochondrium. But what is most surprising of all, the girl during the whole of her illness had a plump and rosy appearance. At intervals of ten and twelve days four ounces of thick and greenish urine were drawn off by the catheter."

She continued to vomit two or three times a day, or whenever a single spoonful of liquid was given, bringing up calculi mixed with blood. This caused so much distress, that for four months she neither eat nor drank, taking only a little sweet oil and sweet spirits of nitre. The bowels remained constipated, all the clysters administered being vomited. Ten ounces of crude mercury were given, but it slipped through the bowels unchanged. The dysury was urgent; and although the catheter was introduced every third day, not more than two or three ounces of green urine were drawn off, oftener than every tenth or twelfth day. Subsequently the urine became loaded with gravel: the pains returned with excruciating violence, so as to induce delirium, followed by stupor, singing, laughter, &c. After a constipation of four months duration, the bowels were moved by a solution of *Sal. Polychrestum* (sulphate of potass) in a large quantity of warm water. Six ounces were administered every quarter of an hour until three pints were swallowed, the patient's mouth being held close after each exhibition, so as to prevent the liquid being returned. The result was an evacuation of a mass of indurated feces, so large that it was feared the rectum would burst. During the four following months the bowels were moved every sixth day. After that period they again became constipated, and the patient vomited feces.

Four months after this, the catheter was introduced, but no urine flowed. Shortly after, she passed spontaneously eight pints of feculent greenish urine. She then for three months vomited up (instead of discharging by its natural passage) three or four ounces of strong-smelling urine every second or third day. For five months the patient continued in moderate health, passing every day from three to five ounces of a clear yellowish water, at times slimy and bloody. She occasionally passed a calculus by the urethra, and vomited calculi. The belly continued tumid, and there was a painful hardness in the left hypochondrium. Subsequently she improved considerably, but in a few months was attacked by nausea and hiccough, which were followed by violent pains in the abdomen, difficult respiration, hysterical paroxysms, palpitation of the heart, convulsions, and loss of speech. These were followed by a discharge of a calculus by stool. Every morning, while making water, she vomited three or four ounces of urine of the same smell, colour, and consistence, as that discharged from the bladder. The abdomen continued tumid; a gangrenous spot showed itself on the right leg; she had also *angina notha*, and a hemorrhage from the fauces.*

Nothing satisfactory can be learnt respecting the nature of the calculi from the analysis given by Dr Slare † and Dr König. ‡

4. A nun of the order of St Francis, aged 35 years, of a thin and delicate habit of body, and who had long been subject to hysterical complaints, was attacked with pains, spasms, and swelling of the abdomen, to which succeeded a violent and alarming suppression of urine. Soon after she felt a pain which she described as ascending from the lower part of the abdomen to the stomach, and she vomited a fluid, which without any difficulty was known to be urine. This vomiting continued forty days, during which the patient voided no urine by the usual channel, unless the surgeon drew it off with a catheter, and even then the quantity scarcely amounted to an ounce a day. The urine resumed its natural course spontaneously, and continued in it for twenty days, when she again vomited it, and complained of acute pain in the region of the pubis. On attempting to intro-

---

* Phil. Trans. Abridg. Vol. ii. p. 510. Vol. iii. p. 298.

† Idem, No. 182. p. 140. ‡ Idem, No. 181, p. 94.

duce a catheter the surgeon found the urethra so contracted that it would not admit a probe. The vomiting continued for thirty-two days, and was not then relieved.[*]

5. Lucy Foster, aged 15 years, a muscular, healthy-looking, well-proportioned young woman, was attacked with a pain in the left hypochondrium, accompanied with cough, fever, oppression of the chest, and difficulty of breathing. She menstruated at the age of thirteen. After some time she vomited a quantity of bloody pus, of a very disagreeable kind; her stomach was exceedingly irritable, and she had a suppression of urine for twenty-four hours. She recovered, and continued well for a year. Her former complaint then returned with greater severity. Opium and small bleedings were the only remedies which relieved her great distress. She vomited everything she took. A month from the commencement of the attack, she was attacked with a suppression of urine, which continued five days. On the sixth, she was taken with vomiting, which continued until she brought up nothing but water, which, she said, tasted in every respect like urine. The vomiting relieved her from the swelling and great soreness in the hypogastrium.

"For ten weeks successively she was incapable of retaining on her stomach either food or medicines, except opium. Whenever I omitted to draw off her water once in thirty or thirty-six hours, she never failed to vomit it up. To ascertain so extraordinary a fact beyond the possibility of a mistake on my part, or a deception on hers, I often visited her about the time I knew she must vomit, if the catheter were not introduced; and I examined her bladder, found it full, hard, and tender, and sat by her till the vomiting occurred, saved the water that she brought up this way, compared it with what I drew off, and found it the same in every respect."

The urine subsequently passed off by the navel for three days successively, on an occasion when the catheter was not used for several days, and she did not vomit. A brick-coloured gravel began afterwards to pass off by the catheter, and she subsequently vomited a similar gravel mixed with urine, and a few months before her death she passed the same by stool. She twice passed a small quantity of urine through the urethra, in consequence of being frightened. She had pain in her head, tenderness and swelling in the hypogastric region; "her urethra, bladder, and genital parts" became extremely sore. "She voided at different times by vomiting, (after she had thrown up all her urine) a bloody pus, of a very disagreeable appearance and coppery taste. Her bowels for the most part were much less constipated than could have been expected, considering the frequency of vomiting, her supine situation, and the little nourishment she was able to retain upon her stomach." She introduced the catheter herself, and sometimes drew off her urine to the quantity of a gill. Before her death "she became quite paralytic at times. She had several convulsion fits after vomiting," and at last became lethargic. The period between the commencement of the second attack and her death was upwards of three years.

---

[*] A Collection of Medical Facts, &c. by S. F. Simmons, M. D., Vol. vi. Lond. 1795.

On the examination of the corpse, "the stomach appeared very much changed from its natural colour, and in a gangrenous state, containing a semi-purulent matter of a fetid scent." In the cavity of the uterus was contained about a drachm of thick, dark, fœtid pus. The *corpora fimbriata* had a gangrenous appearance. Nothing remarkable was observed in the other viscera.*

6. Ann Fooks, when aged 15, fell and struck the region of the stomach violently against a large stone. This produced vomiting of blood, which continued with occasional remissions for about seven years. She expectorated a yellowish phlegm mixed with blood; her stomach was hard, swollen, and painful, and she suffered greatly from the constant vomiting and hectic. She menstruated regularly during this illness from the age of 15. At the end of this period she began to complain of violent darting pains in the head, and indistinct and double vision. This state lasted six days, when she became insensible, and remained so for about ten days, sometimes dosing with her eyes half closed, moaning, and at times talking deliriously, and rolling her head about the pillow. During this period, a discharge of matter and blood, very offensive, took place one night from her ear and nose, and continued to escape from the right ear for six weeks. The head symptoms were then alleviated, but as soon as the discharge ceased, the arms and legs became œdematous. During this state, for forty-eight hours she could not pass urine, although there was a frequent call to make it. The stools were slimy, and the bowels were very costive.

These various distressing symptoms were gradually alleviated during the two succeeding years, when she was seized while sitting in her chair with giddiness and dimness of sight, followed by a paralytic affection of her left side. Three or four weeks after this, a violent tetanic affection of the upper extremities came on, and continued four or five days. The paralytic affection lasted between three or four months and then went off. For a year and a-half, with slight exceptions, her disease was suspended. After this she passed no urine for a week, and subsequently no stool for ten days. She twice vomited feculent matter. Two days after the second feculent vomiting, she had a stool naturally, but extremely costive, hard, and lumpy, accompanied at the time with violent pain just above the navel. Soon after she ceased to pass her urine; the epigastric region became swelled and prominent from the spleen to the liver, and to the umbilicus, and extremely tender; her respiration quick and short, with cough; no appetite, and she vomited a dark fluid like chocolate grounds occasionally, and her urine regularly for six months; sometimes it came up twice a-day. All the matters vomited had a urinous taste. There was no fulness of the hypogastrium; the pudenda were hot, dry, and sore. At the end of the period just mentioned, after delirium, insensibility, rigors, and acute pain about the umbilicus, she passed four or five stools composed of clotted blood, and shortly after about a pint of urine; this was followed by frequent desire to make water, which was bloody. During the succeeding seven months she continued to pass urine, which was occasionally mixed with blood; the bowels were frequently torpid, the stools mixed with blood, and she had a severe attack of bloody vomiting. Her nights were generally sleepless. Animal food produced so much pain of the stomach and nausea, that she was obliged to confine herself to farinaceous food in small quantities. She had occasional syncope, contraction and spasmodic affections of the limbs, especially on the left side. For several weeks she sweated so profusely that it was often necessary to have her linen changed every hour.

---

* London Med. and Phys. Jour. Vol. xxx. p. 493, and Vol. lix. p. 542.

A long controversy was carried on in connection with this case. There were not a few who considered it a case of imposition. On the other hand, very weighty testimony was brought forward to prove its truth. The relator never saw his patient vomit urine, but was an eyewitness of a great proportion of the other circumstances mentioned. Her sufferings produced little or no emaciation.

7. A young lady, the daughter of a respectable army surgeon, was under the care of her father and a physician for two years. The death of her brother by drowning had conspired, with other events, to induce syncope and a variety of nervous symptoms, which had resisted all the mineral, tonic, and nervous medicines which are commonly employed in such cases. Being sent to Yarmouth, she came under the care of Dr Girdlestone. She was about twenty years of age, fair, and not unhealthy in her complexion; and though she was pale, yet she had more the appearance of a muscular than of a fat person. She had no use of her lower extremities, nor could she lie down without inducing fits of hiccough or vomiting. Animal food, or any liquid, immediately on entering the stomach, excited vomitings; and during the greater part of the two years she resided at Yarmouth, she was obliged to live entirely on fruit, and to sleep in an erect posture in a chair. The liquid vomited up proved to be urinous, and on standing for some

time, had the healthy nebula of common urine. She usually vomited about six or eight ounces at a time, with intervals of about six or eight hours; and if animal food had not been taken to hasten its rejection, it was unmixed with food. She ceased to pass urine from the bladder for above two years.

Her motions were invariably found to take the shape of a distended rectum, and to have come away without a single drop of urine; and in the presence of Dr Girdlestone and Mr Borratt, the catheter was introduced by Mr Downe, and the bladder was found not only empty, but so contracted, as to lead to the belief that no urine had entered the bladder for some time. Dr Girdlestone adds, that every medical man in the place (Yarmouth) at that time was made to bear witness to the case. After having tried pills with her repeatedly, without the combination of any animal food with them, he had some beef pounded into pills. Some of these were swallowed in the presence of Dr G. and Mr Borratt. In twenty minutes she began to express her doubts of being able to retain the pills, as she was feeling the same sensations as if she had animal food in the stomach. The pills deprived of the gum tragacanth which surrounded them, soon came up, with a considerable quantity of urine. Having continued at Yarmouth two years with these symptoms, she left, and in a few weeks died. An examination of the corpse could not be obtained.

It is to be regretted that the relator of this case did not explain more at length the " variety of nervous symptoms" which his patient suffered. Most probably they were the symptoms of hysteria in an aggravated form.

8. The history of this case extends through some years. Maria Brenton was of sound health, until she was afflicted with suppression of the catamenia, accompanied by hæmoptysis. She was bled profusely and emetics administered, the operation of which was succeeded by a *prolapsus uteri*, and a total inability to perform the urinary functions. In this state she continued nearly two years and a-half. The catheter was introduced once in twenty-four hours, and if its use was omitted, she perspired profusely about the lumbar region. At the end of the period just mentioned, the catheter was not introduced for seventy-two hours, and the urine found an outlet by the *right ear*, oozing drop by drop. The quantity gradually increased, until it was discharged to the amount of eighty ounces in twenty-four hours, flowing in a stream the size of a crow quill. This discharge was accompanied by a severe pain about the right eye and ear.

When the urine was not discharged at the usual period, or much diminished in quantity, the pain and distress were most excruciating, producing delirium, during which she would be very violent. Sometimes, however, she would merely laugh, sing, and converse very incoherently. At other times she would be seized with violent spasms, resembling opisthotonos ; and after continuing in this situation for a few minutes, the muscles becoming relaxed, she would heave a deep sigh, and then swoon, and remain in an insensible state for half an hour, when she would sob perhaps, open her eyes, and after repeatedly sighing would again become insensible. Sometimes the spasms were unaccompanied by swooning. She had trismus at one time for three days. The swooning would be also unaccompanied by spasms, when she appeared cataleptic. The sight of the right eye was soon destroyed, and frequently that of the left was so impaired, that she could not distinguish any object across the room. The latter was subsequently restored. The hearing of the right ear is much impaired, she cannot distinguish sounds with it.

Urine next flowed from the *left ear*, *left eye*, afterwards was discharged from the *stomach*, " frequently, soon after food had been taken, with which it was often entirely unmixed." The urine next flowed from the nipple of the *right breast*, afterwards from that of the *left*, next from the *navel*, and finally, " nature, wearied in her irregularities, made her last effort which completed the phenomena of the case, and established a discharge of urine from the *nose*." flowing guttatim as from the ears, eyes, and mammæ. Previously to the flow of urine from the navel, " the abdomen about the hypogastric and umbilical region became violently and spasmodically contracted into hard lumps, and a sharp pain was felt shooting up from the bladder to the umbilicus, around which there was a severe twisting pain ; in a few days subsequently a loud noise was heard, similar to that produced by drawing a cork from a bottle, and immediately afterwards, urine spirted out from the navel as from a fountain."

All the fluids discharged were found by analysis to contain urea.

The urine from the bladder turned black when not drawn off at the usual period, and deposited a sediment resembling black sand ; the supernatant liquor sometimes remaining after this deposit as black as ink. On several occasions it was noticed that when the urine was most limpid, the largest quantity of black sediment was precipitated.

The discharges from the other outlets have occasionally all turned black, and came off black, differing in this last respect from the urine secreted into the bladder.

" The quantity of urine discharged from the outlets was so great, that I was apprehensive there might have been some deception. To remove every doubt, I and my friend Dr Webb remained with her four hours alternately during twenty-four hours ; and the quantity discharged during this time was as large as it had been during several days previous to and after this period. There has never been any doubt that these fluids, which have proved to be urine, were actually discharged from the ear and other outlets; since the fact has been proved, day after day, by ocular demonstration."

Subsequent to the cessation of the catamenia, there was a discharge of blood, supposed to be vicarious. It generally came on every five or eight weeks, sometimes at the regular period. For the first two years there was a discharge of blood occasionally from the stomach and lungs; from the breasts, more frequently from the left; from the ears, oftener from the left; and from the navel and nose. From the nose and right ear it was mixed with nearly three-fourths urine; from the left ear with an equal quantity of urine; from the stomach and lungs with the contents of the stomach, and the secretions of the fauces; from the left breast and navel; it has generally been unmixed with any other fluid. It was frequently fœtid; the colour always dark; it sometimes coagulated, though not generally. These urinous and sanguineous discharges continued to flow from the right ear, right breast, and navel, at the time the author narrated the case, but in diminished quantity and frequency. Her death at one time seemed inevitable to all who visited her; yet she recovered sufficiently to ride out. *

II.—*Second Series.*

9. A young nun of slender frame, and living on meagre diet, had spectral illusions, and became melancholy. Soon after, the secretion of urine was entirely suppressed, and so continued for six months. The suppression ceased at the end of this period, and the bowels became constipated during four months, so that during that time the patient had no alvine evacuation. Afterwards, in addition to this, the urine was again suppressed, and she began to discharge from the region of the stomach, a fluid amounting in quantity to many pints, and having the smell and colour of urine. Subsequently the urinary secretion was re-established, the quantity being greater than in health, and the patient became affected with marasmus.†

10. A female, aged 23 years, tall and well-made, was seized with a weakness of one side, which soon went off, leaving only one knee weak and swelled. Some months after she had a stoppage of urine for two days, and had no inclination to pass it; the period of the suppression at a subsequent attack, which occurred a few days after the first, was extended to four days, and next to nine days. When the catheter was introduced into the bladder, little or no urine was found in the latter.

The secretion of urine was ultimately suspended for fifteen months. All this time she could eat once or twice a-day, and walk and ride. She had but little sleep, her breathing was often very laborious, with a dry cough; the catamenia were irregular; there were œdematous swellings in her limbs, abdomen, hips, and face; but by the help of purges and spontaneous vomitings which began in the third month of the suppression, these swellings were reduced. She vomited sometimes every day, or every third or fourth day; and though these vomitings usually came on immediately after dinner, the fluid rejected seemed to be pure urine, not having any food mixed with it. In the thirteenth month of the suppression, the nipples of her breast became cracked, and discharged sometimes a watery humour, sometimes a thick matter streaked with blood, and sometimes a fluid resembling urine in colour. All these discharges had a urinous smell, and after their appearance the urinous vomitings became less frequent. Her legs swelled, her body became of an extraordinary size, and she breathed with the utmost difficulty.

---

* London Med. and Phys. Journal, Vol. lix. p. 538.

† Schenck, Lib. iii. Obs. 170.

Before the urine returned to its natural channel, "she felt uncommon pricking pains, with great heat all down her back and loins, and about the belly and groin." She then "voided about three ounces of thick slimy matter," and shortly after a little urine, accompanied, however, with considerable pain. This secretion became re-established to a certain extent, but she frequently had a suppression for a few days, and usually did not make half a pint of urine in the twenty-four hours.

11. A young female, after having been severely affected with hysteria for eight months, suffered a complete suppression of the alvine and urinary evacuations. Enemas, warm baths, and other remedies were administered for three months, without any relief. The use of cold baths during two months at length caused urine to be secreted, and the alvine functions to be formed. A profuse perspiration supplied the want of the urinary secretion.

12. A female, aged 23 years, was exposed to cold, while the catamenia were flowing abundantly. She was admitted into the Worcester Infirmary with feverishness, a very deficient secretion of urine, and difficulty of passing it. Her abdomen became distended, bowels were constipated, she vomited incessantly, and passed little urine. For five days there ceased to be any urine drawn from the bladder by the catheter. She was delirious or insensible at nights; her pulse rose from 60 to 80; sixteen days after her admission a bloody discharge appeared at the umbilicus, after which the abdominal pain and tension were relieved. The vomiting became worse. This bloody discharge continued for four days, and on the fifth, it assumed a urinous appearance and smell. She had then passed no urine by the urethra for three days. The head was very painful; pupils dilated; bowels costive. The catheter was introduced, but no urine found in the bladder. Eight days after this, six ounces of urine were drawn off by the catheter, and in an hour after the operation, two quarts of urine of the same appearance

gushed from the umbilicus. This discharge of urine from the navel continued for three days, and was accompanied with great improvement in the general symptoms. At the end of that period, it ceased for three days; on the fourth the catheter was introduced into the bladder, and no urine was found. In an hour after this, two quarts of urine gushed from the umbilicus. Nine days after this, four ounces of urine were drawn from the bladder, for the first time during several days. During these nine days the patient suffered much from vomiting, and daily passed urine by the umbilicus. The catheter was passed every day and no urine found, but the bladder contracted strongly on the instrument. Sometimes immediately after the catheter was removed, a discharge of urine would take place from the umbilicus, and once as much as three quarts were thus passed. All this time the medicine she took was chiefly purgatives. Blisters were applied to the neck and epigastrium. The bladder was subsequently restored gradually to its proper function, and in little less than three months she was discharged in tolerable health, but still often complained of pain in the pelvic region. She menstruated regularly during the attack. Thirteen years after, she was again admitted into the Infirmary for paraplegia, from which she recovered. There was no return of the former disease, although the use of the catheter was necessary.

Dr Hastings thinks that the facts of this case proved that the urine was secreted vicariously from the umbilicus, and not transmitted from the bladder along the urachus.

III.—*Third Series.*

13. A female, aged 21 years, the mother of one child, fell so, that she fractured two of her ribs, and injured the spine and hip. She remained lame on one side until her death. Twenty or thirty hours after the fall it was found necessary to evacuate the bladder by means of the catheter. Its use was continued for two months, never drawing off more than ten ounces of urine in the twenty-four or forty-eight hours, so that there was a suppression as well as a retention of urine. She was subsequently able to empty the bladder by her own efforts, with great difficulty, once in twenty or thirty hours. About this time "she was suddenly attacked with a violent pain at the stomach, which required twelve grains of opium to allay it. This returned on alternate days, and always terminated with sickness and a vomiting of fluid, possessing all the properties of healthy urine, with a disagreeable excess of uric acid. This urinous fluid was repeatedly discharged in the presence of myself and several other persons, and was minutely examined. It was observed, that on the days when this pain and vomiting occurred, no urine was discharged from the bladder; but on the intermediate days it was secreted, and evacuated in the usual manner. She remained in this state seven weeks, when her bowels be-

came constipated for ten days. A tense tumour of considerable magnitude occupied the region of the kidneys, and was circumscribed. No fluctuation could be perceived in it. The pain in the stomach ceased spontaneously; and the vomiting was attended with hiccough and a urinous perspiration, which was particularly profuse on the forehead. No urine was discharged from the bladder. After the bowels had been evacuated, the tumour rather subsided. The pulse continued at 90, the appetite was good, and she had not experienced emaciation. She soon afterwards died. The cadaveric appearances are not detailed. This patient being probably *hemiplegic* the case is placed in this series, as showing marked lesion of the nervous centre, although functional only, as it would appear from the periodical vomiting.

14. A young lady, slender, but originally healthy and active, after recovering from scarlatina, had a severe pectoral complaint. She had diarrhœa, aphthæ, a heavy expectoration, and became emaciated. After an attack of diarrhœa, (supposed to be inflammatory,) her bowels became constipated, so that discharges from them were rarely procured, and those with considerable difficulty. She took little sustenance, her stomach rejecting almost every thing, although emaciated to the last degree, and apparently very near death. She was able to bear a voyage of fifty miles into the country; her abdomen then became tender and inflated; she seldom had a stool oftener than once a-week; and the greatest part of her food, which was all liquid, and her medicines, were rejected from her stomach. What she vomited was offensive in the extreme, and often evidently stercoraceous; in some instances it had a urinous taste and smell, little urine being either secreted into or passed from the bladder. After a little time there was a manifest improvement in her general health; the vomiting also was less severe; but it occurred every day; the intervals between each alvine evacuation became longer; the urine was seldom passed, and then with pain, and in very small quantity; catamenia regular. Her usual sustenance was tea, toast, milk and gruel, but no solid food. There was no swelling of the abdomen.

" She is now in her thirty-seventh year, and has been in the state described for the last seven years. For the last eight months she has had no passage from her bowels, and only two or three during the preceding year; and she scarcely passes any urine. There is no possibility that any deceit can be practised, as she sleeps in a room with a confidential attendant; and is closely watched by her parents and sister. She never makes the slightest locomotive exertions with her lower limbs, but has the complete muscular power of the upper extremities. Her disposition from being cheerful and gentle has become peevish, irritable, and obstinate. She neglects the amusements of books and music, in which she formerly indulged."

Dr Crampton alludes also to the similar case of Ann Free, which came under his notice at Steeven's Hospital. When this patient had a stool, it was considered quite an extraordinary occurrence, and she never passed urine except when relieved by the catheter. She vomited occasionally excrementitious matter; and for a considerable time, when no urine appeared to be secreted, she threw up a fluid of a urinous taste and smell. It is not stated whether she were paraplegic or not. Most probably she was.

IV.—*Fourth Series.*

15. A young female of rank, aged 11 years, had a tertian fever for three months. She recovered without any other complaint than a profuse flow of blood and spectral illusions. After much grief for the loss of some relatives, she became melancholy, had severe headach, and pain in the abdomen. Subsequently her bowels became obstinately constipated, so that at last no evacuations could be obtained by any means. The abdomen became swollen: next followed immoderate laughter, constant watching, spectral illusion, and then a cough so severe came on that the patient could scarcely speak. A tumour appeared in the epigastrium, a quotidian fever harassed the patient during the winter. No means were effectual to produce a stool; and while the urine was diminishing in quantity, the paroxysms of fever occurred night and morning. In a short time the urine, previously clear, became like white of egg, and at last was totally suppressed. There was no discharge from the nose or ears, and no sweat during the period of this suppression of the alvine and urinary evacuations, until there occurred a profuse discharge of blood. A remarkable loathing of food followed, and continued during a long period. After the cessation of the febrile attacks it diminished; but the patient still abhorred animal food. If she took a small quantity of the latter, vomiting of her food would come on, mixed with blood. After a while she had severe headach, accompanied by frequent general convulsions, and an appearance of insanity. They were of an epileptic character, and periodical.

After the constipation and suppression of urine had continued eight years, urine began to be observed in the enemata, which were administered every third day, but no urine flowed by the urethra. The patient ultimately recovered, married, and enjoyed good health.

16. A female was attacked with complete suppression of the urinary and alvine evacuations. She lived twenty years[*] without passing stool or urine, taking but a small quantity of food, and subject to frequent vomitings and epileptic convulsions.

---

[*] From the expression, "Honesta quædam virgo, *ante annos viginti*," I am inclined to think the disease commenced before the female was twenty years of age. Ante, as an adverb, in the sense of *since*, is usually joined with an ablative case, as "viginti antè annis," *twenty years since*. Schenck, however, interprets the phrase as in the text, thereby corroborating the opinion of Dr Peebles,—Ed. Med. and Surg. Journal, Vol. xlvi. p. 152.—Schenck, Lib. iii. obs. 253.

17. A young female, whose case was well known at Verona, had not excreted a drop of urine for twenty-two months, when Zeviani reported her case. The bed-clothes had a urinous smell, as also had the room. Although *afflicted with many diseases*, she had no affection of the brain. *

18. In this case the patient was a female. It was necessary to use the catheter for many days together, and occasionally there was a total want of the secretion of urine; the kidneys more than once suspending their functions for five weeks. There was no coma, stupor, or vomiting. The patient was very subject to violent spasmodic affections, and to inflammatory attacks of the organs of respiration, with a tendency to hemorrhages for many years from the nose, lungs, uterus, and intestines. After death the body was carefully examined; the pulmonary and costal pleuræ were adherent. The kidneys and other organs were sound.

V.—*Fifth Series.*

19. A case of a female who had urinous vomitings and sanguineous discharges with hysterical symptoms.

20. "Mirabilis alvi et urinæ suppressio in Judæa virgine hystericâ." †

21. Case of a young female who had suppression of urine, and vomiting of a urinous fluid, which continued many days. ‡

22. A female, when aged 43 years, was suddenly seized with a suppression of the urinary and alvine evacuations, which continued seven years. The most active diuretics and cathartics were tried in vain, until at last the discharges returned spontaneously. During their suppression she was subject to very copious and most offensive sweats, which continued for two or three hours, and recurred every day, or every second or third day. She was confined to bed the whole time, being unable to move; but ate well, and was fat, and of a florid complexion.

23. Nysten observed vomiting of urine in two females aged 26 and 40. In the second an imposition was detected.

24. Dr Cheyne "saw a girl in 1797 who vomited at stated times a fluid with all the sensible qualities of urine; the discharge by the urinary passages having been long suspended."

25. "An instance of a woman who lived twenty-eight years with copious vomiting, believed urinous, accompanied with extraordinary phenomena." §

26. This case belongs to the second series. The urinous vomiting was observed in the Westminster Hospital.

27 Belongs to the first series, and is a well marked-case. The

---

* Morgagni, De Sedib. et Caus. Epist. 41. Sect. 5.

† Van Swieten apud Boerhaave, Tom iii. p. 228, (Ed. 2da.) Lug. Bat. 1750.

‡ Morgagni, De sedib. et Caus. Morbor. Epist. 41. Sect. 41.

§ Ed. Med. and Surg. Journal, Vol. xlvi. p. 152.

urine was discharged from the stomach, mammæ, umbilicus, and skin of the legs. The details of the two last having been recently recorded, are not given here.

An erratic discharge of urine is an unusual symptom of disease. The following are the more general circumstances under which it appears.

Urine has been discharged from the *anus* when there was no known communication between the rectum and bladder. This has most usually occurred in *boys*.

The examples of this discharge from the *umbilicus* have been observed (with few exceptions) in *females*. It has been commonly supposed * that in these cases a communication is formed betwen the bladder and umbilicus, along the urachus. This opinion Mauriceau † long ago combated on anatomical grounds; nor have I yet met in my reading with a dissection which proves it. There are two or three cases in which the bladder was ruptured at the umbilicus, and contracted an adhesion to the latter. In cases numbered 7 and 12 in this paper, urine flowed from the umbilicus when the bladder was empty.

Vomiting of urine has occurred principally in hysterical females, but has been observed occasionally in males suffering from suppression or retention of urine. ‡

Urinous discharges from the ears, salivary glands, and skin, of both males and females, have also been observed in the latter class of cases.§

The mammæ in some rare instances have been an outlet for this fluid.

The details of the cases I have given from authors must be read with some suspicion. It is not a little remarkable that the greatest number of medical rarities have occurred in females,—military malingerers excepted. Most cases of imposition have occurred in females, particularly those affected with the rarer forms of hysteria. Dr Seymour || mentions several such cases. Mr Gibbon ¶ refers to a case well known in Guy's Hospital, of a female who drank her urine. M. Nysten ** reports two cases of vomiting of urine and fæces in females, one of which was subsequently shown to be a deception, the patient having previously

---

* The Cyclop. of Anatomy and Physiology, Art. "Urinary Bladder, Abdominal Anatomy of," and others.

† Traitè des Maladies des Femmes Grosses, Tom. i. p. 219.

‡ Epist. Georgii Tanstetter, Oct. 1537, in Schenck, Lib. 3, Obs. 199. Haller, Elem. Physiolog. Tom. ii. p. 372, and others.

§ Sauvages (Ephidrosis Urinosa) Nosolog. Tom. ii. Morgagni, de Sed. et Caus. Epist. 41, Art. 5. Haller, loco citato.

|| London Medical Gazette, Vol. xix. p. 506.

¶ London Medical and Physical Journal, Vol. xxxi. p. 24.

** Journal Génèrale de Médecine, Tom. xl. (1810–11.)

swallowed the matters vomited. She practised her tricks successfully for ten months.

The singular resemblance of the symptoms observed in the cases detailed is, nevertheless, a strong proof of their accuracy, and this remark is equally applicable to cases 1 and 2. Many cases of deception have been founded in reality. Moore of Tutbury, and her rival the Osnaburgh woman, * had a remarkable power of enduring long abstinence. They gave exaggerated and false reports of this power, for the purposes of gain, and were compelled to deceive when the truth of their statements was tested. Such probably was the case with H. O.

The history of these cases would have been more complete if their relators, after having satisfactorily ascertained that urine really passed from the outlets mentioned, had prosecuted their inquiry further, and endeavoured to learn how this occurred. Taking them all together, it appears that for the most part they were examples of an exaggerated and very chronic form of *hysterical ischuria*, of which a vicarious discharge of urine would be the legitimate and necessary consequence.

Hysterical ischuria in a mild form is of no uncommon occurrence, and, doubtless, is frequently overlooked by or concealed from the practitioner. A young female will suffer for twenty-four or thirty-six hours a suppression of urine. If the hand be placed upon the hypogastrium, no distension of the bladder will be observed. She is perhaps alarmed at the occurrence of this long interval, the pulse will be found much quickened, but nothing otherwise remarkable will be noticed. At last, the patient voids a few tablespoonfuls of urine, and nothing more is heard of the suppression. Here, there is that want of exercise of the function of volition which is said by Sir B. Brodie† to occur in hysterical retention of urine, but, in these cases at least, it probably happens, because the contents of the bladder are in too small quantity to give it the requisite stimulus to action, or to enable it to contract efficiently upon them. Females who come under the head of *hysterical impostors* will wilfully retain their urine for certain purposes; but in these, not only is volition not exercised, but the contractile power of the bladder is resisted.

Paralysis, producing inability to move, obstinate constipation, and retention of urine, is a prominent feature in the cases before us. This paralysis occurs in the secreting as well as the muscular structures. It has been said to "simulate" the more common form of the affection.‡ It appears, however, that in those suffering under the varied forms of hysterical *paralysis*, the loss of power to move is frequently as complete as in cases of softening, compression, or direct injury of the spinal chord. An inquiry into the causes of this and other of the symptoms of hysteria will be entered into more at large in another place. If an opinion might be ventured upon here, I would say that hysterical *paralysis* is the result of functional derangement of parts of the nervous system, the common form, of structural lesion. A similar relation exists between them, as there is between arthritic and idiopathic gastritis. This remark is equally applicable to hysterical and traumatic tetanus, and many other affections of the nervous system.

---

* Hufeland's Journal, 1802.

† Lectures in London Med. Gazette, Vol. xix. p. 246. ‡ Ibid. p. 506.

Remarks upon this question must be deferred until the series of cases illustrative of other aggravated forms of hysteria are completed. I think they will show that their varied and remarkable phenomena afford good grounds for supposing, that they are caused by a *translation of the exciting cause* of this functional derangement from one portion of the nervous system to another; singularly resembling the metastasis which occurs in serous, synovial, and mucous membranes.

ART. IV.—*An Experimental Investigation into the Functions of the Eighth Pair of Nerves, or the Glosso-Pharyngeal, Pneumogastric, and Spinal Accessory.*[*] By JOHN REID, M. D., Fellow of the Royal College of Physicians of Edinburgh, Lecturer on the Institutes of Medicine, formerly Demonstrator of Anatomy, &c.

THE Eighth Pair are undoubtedly the most interesting and important of all the nerves of the body, both in a practical and theoretical point of view. Their lesions are attended by the most serious derangement of the respiratory and digestive processes, and bear in a prominent manner upon some of the principal doctrines in physiology. The functions of these nerves have, therefore, commanded a more than ordinary degree of attention, and the industry and talent of numerous observers have been directed towards their elucidation. In entering upon an experimental investigation into the functions of the three divisions of this pair of nerves, I was fully aware of the numerous difficulties attending such an undertaking, and have endeavoured to approach it with all the circumspection and assiduity which its importance and inherent intricacies require. I, nevertheless, feel very considerable diffidence in presenting the first results of this inquiry to the public, since the data which I have obtained will necessarily lead me to draw several important inferences regarding the functions of these nerves, at variance with those entertained by many of the most celebrated and experienced practical physiologists. And most persons feel disposed to receive with caution or even distrust the observations and opinions of one who can scarcely be said to have finished his novitiate in the difficult task of unravelling the operations of the complicated machinery of the higher organized bodies, and the more especially when a considerable part both of his premises and inferences are in opposition to those promulgated by physiologists, whose years and well-earned fame, acquired by their long and laborious exertions in the extension of this science, entitle their opinions to the highest credit. Being confident, however, from my previous pursuits, and from the great care with which I conducted, after their death, the dissections of all the animals operated upon, that I could not possibly be mistaken as to the particular nerves upon which the experiments had been made; profiting largely from the recorded errors and instructions of those who have preceded me in this field of inquiry; and taking the very necessary precaution of making a careful repetition of the experiments under varied circumstances, so as to avoid as much as possible any accidental sources of error, I have been encouraged to publish the results thus obtained,—being satisfied that the facts will be found, upon actual examination, such, or at least nearly such, as I represent them. In entering upon this investigation I had no favourite theory to defend, stood committed to no preconceived notions, or shackled by any slavish deference to authorities, but was ready and willing to give up any of my former opinions as soon as they appeared to be inconsistent with the phenomena which presented themselves; and I sincerely hope that I am not chargeable with the opposite and equally dangerous fault of seeking and hankering after novelties.

---

[*] A short epitome of this paper was read at the last meeting of the British Scientific Association.

In stating the experiments, I shall enter more fully into the details than many may think necessary, as it appears to me that it is an object of essential moment to mention all the circumstances under which any important experiment is performed in physiological investigations, where so many extraneous circumstances are apt to interfere with the results; and I am convinced that if this plan had been more fully followed, many a controversy might have been avoided, as well as much animal suffering spared, and the science would this day have presented fewer discordant statements, and less unfortunate collision of opinions. It may appear to some that I have repeated many of those experiments with unnecessary frequency, and a wanton sacrifice of animals. But I naturally felt diffidence and distrust in the accuracy of the results which I obtained when opposed to those of more experienced observers, and it was only after repeated and careful examination of the phenomena, that I could feel myself justified in calling these in question. It is also sufficiently obvious, that nothing is more injurious to the progress of science than hasty and partial observations; and I was anxious to avoid, as far as I possibly could, adding to that mass of conflicting evidence, which there is already so much reason to deplore. Besides, as every false observation requires additional experiments for its refutation, I felt that, with less extended opportunities of witnessing the phenomena under examination, I must incur a greater risk, not only of throwing obstacles in the way of the progress of truth, but also of occasioning a useless infliction of animal pain.

In detailing the following experiments, and the conclusions which I feel inclined to draw from them, I shall follow the order in which the nerves, generally included under the eighth pair, are enumerated, and therefore commence with the *Glosso-pharyngeal.*

Part 1st.—*Glosso-Pharyngeal Nerve.*

The experiments on this nerve were all performed upon dogs, and were twenty-seven in number. Seventeen of these were for the purpose of ascertaining if it were to be considered a nerve both of *sensation and motion*; and what are the effects of its section upon the *associated movement of deglutition*, and on the *sense of taste.* The other ten were performed upon animals, immediately after they had been deprived of sensation, with the view of satisfying myself more thoroughly, how far it is to be considered a *motor nerve.* In cutting down upon this nerve in the living animal, the following plan was adopted after a careful examination of the anatomy of the parts. An incision, varying in length, in proportion to the size and species of the dog, was made nearly parallel to the back part of the base of the *inferior maxilla;* its posterior termination always extending a short distance over the anterior margin of the *sterno-mastoid muscle.* After cutting through the *skin* and *platysma myoides* or *cutaneous* muscle, the two large veins which go to form the *external jugular* were each secured in a double ligature, and cut across between the points tied. The *glands* at the angle *of the jaw* were removed or dissected aside, and the *carotid artery* exposed. The artery was generally first secured in a ligature below the *hypoglossal nerve*, and before it had given off any of its large branches; it was then exposed above the *hypoglossal*, included in a double ligature and cut across. This was found to be the most effectual method of preventing the troublesome hemorrhage, which otherwise is apt to occur from wounding the large arteries, arising from the carotid at this point. After this by a little dissection, the nerve was exposed as it lies upon the lower margin of the *stylo-pharyngeus muscle*, near its origin from the *styloid process*. One of the best guides in displaying the nerve, is the *osseous expansion* connected with the *tympanic cavity* of the *temporal bone*, which is always readily felt after the *carotid* has been exposed. In dissecting the nerve back to the *foramen lacerum posterius*, great care must be taken to separate it from the *pharyngeal branch of the par vagum*, which lies sometimes in immediate contact with it, at other times one or two lines below, and is frequently united to it by a considerable communicating branch, so that it may readily be mistaken for a large pharyngeal branch of the glosso-pharyngeal. I am afraid, for reasons to be afterwards stated, that sufficient precautions have not been taken by other experimenters to separate these from each other. This is the more necessary, as I am confident that these two nerves differ very materially in function, and this must consequently have seriously affected the results. The superior laryngeal branch of the *par vagum* is placed a short distance below these two nerves, but was rarely seen except when exposed designedly. I have observed very considerable differences in the manner in which the glosso-pharyngeal gives off its branches to the pharynx and fauces: sometimes it begins to give off small filaments soon after it has emerged from the base of the cranium, and continues to give off a number of small branches in succession, until it has furnished all the filaments to the pharynx and fauces; more commonly the nerve forms a sudden enlargement upon the lower margin of the osseous expansion of the tympanic cavity, from which the principal branches to the pharynx and fauces are given off, one or two of which are much larger than the others. It is almost needless to add, that in all the animals kept alive, after section of these nerves for subsequent observations, a considerable portion of the trunk of each nerve was removed. The first point connected with the function of the nerve to which I directed my attention was the disputed question, whether or not it is to be considered both a *motor* and *sensitive* nerve. In investigating this it has occurred to me, that the discordant results obtained in late experiments may be explained. It is with this object, as well as with the view of pointing out the difficulties I encountered at the outset, that I have here given the details of the first experiments, as they are put down in my notes taken at the time. These may serve as guides to those who may afterwards wish to turn their attention to this subject.

Is the *glosso-pharyngeal* a nerve both of motion and sensation?

Exp. I. June 3, 1837.—The glosso-pharyngeal nerve was exposed on one side in a middle-sized terrier, and irritated by pinching it with the forceps, but no satisfactory evidence either of sensation or motion was observed, even when tied tightly in a

ligature and cut across. When the same nerve was exposed on the opposite side, a powerful and sudden convulsive movement of the muscles of the throat and lower part of the face, followed the first pinch of the forceps. After I had satisfied myself that this could be readily renewed by irritating the nerve, these muscular twitchings of the face appeared to me to resemble so closely those produced by pinching a branch of the *portio dura*, that though confident that the nerve exposed occupied the position of the glosso-pharyngeal, and that no branch of the *portio dura* lay along the lower margin of the stylo-pharyngeus muscle, yet I could not divest myself of the idea that some unusual distribution, or some other cause, had thrown a branch of the *portio dura* in our way. Another nerve, lying immediately below this, and of somewhat smaller size, was exposed, (which was afterwards ascertained to be the pharyngeal branch of the *par vagum*,) and experimented on under the supposition that it was the glosso-pharyngeal. When this nerve was irritated, no distinct contractions of the muscles of the throat were visible; and though the animal appeared to give some indications of suffering when the nerve was included firmly in a ligature and cut on its proximal side, yet these were far from being decisive.

Exp. II.—On exposing the glosso-pharyngeal nerve on one side in a young dog, the same convulsive movements of the throat and face were observed as in the preceding experiment. Being again considerably perplexed whether this could be the glosso-pharyngeal or not, since most of the numerous muscles thus thrown into convulsive action do certainly not receive any filaments from this nerve; while irritation of a branch of the *portio dura*, though sufficient to account for the convulsive movements of the face, could not, however, explain the extensive movements of the muscles of the throat, I tied a ligature loosely around it, to enable me to recognize it readily again, and exposed the nerve lying immediately below, (pharyngeal branch of *par vagum,)* as in the preceding experiment. No convulsive movements were seen on irritating this last nerve, and the indications of suffering were not distinctly marked. The animal was then killed by blowing air into one of the exposed veins, and the anatomy of the nerves experimented on carefully examined, when we were satisfied beyond the shadow of a doubt, that the nerve, the irritation of which was followed by such distinct convulsive movement in this experiment, was the glosso-pharyngeal. On exposing the pharnygeal branch of the *par vagum* and the glosso-pharyngeal on the opposite side in this animal, as soon as it had ceased to breathe, and when the constrictor muscles of the pharynx were much more fully displayed than during the operation upon the animal when alive, distinct contractions of these constrictor muscles were observed after each pinch of the pharyngeal branch of the *par vagum* with the forceps; while the same irritation applied to the glosso-pharyngeal immediately afterwards, was followed by no visible muscular movement. Being now satisfied that in the preceding experiment we had in the second operation divided the pharyngeal branch of the *par vagum* instead of the glosso-pharyngeal, the animal was killed, and the dissection proved that we were right in our conjecture.

Exp. III.—The nerve was exposed on one side in a small cocker dog affected with the distemper, but no satisfactory evidences of sensation or muscular movements were observed. This might arise from the sickly condition of the animal, or, as we shall immediately show, from the nerve being only irritated anterior to, or on the distal side of that part of the trunk where the pharyngeal branches leave it.

Exp. IV.—The glosso-pharyngeal nerve was first exposed on one side, and then on the other, in a middle-sized terrier. Very forcible convulsive movements of the muscles of the throat and lower part of the face, but more especially of the throat, were observed on pinching these nerves with the forceps. On cutting the nerve across, the same convulsive movements and indications of suffering were noticed on pinching the nerve on the proximal end, or that part of the nerve which retained its natural connection with the *medulla oblongata*. These convulsive movements were exactly similar to those observed when the nerve was entire. There were no convulsive movements on irritating the lower end by the forceps.

Exp. V.—The nerve was exposed on one side in a middle-sized full-grown pointer. When irritated by pinching it firmly with the forceps, only very feeble convulsive movements of the throat were excited, and such as would readily have escaped notice, had we not been in search of them. Professor Sharpey of the London University College, was present from the commencement of this experiment, and as we were proceeding to expose the nerve of the opposite side, we were joined by Professor Alison. On irritating the opposite nerve by pinching it with the forceps, the convulsive movements of the muscles of the throat were distinctly marked, but still in a less decisive manner than in some of the preceding experiments. The nerve was then included firmly in a ligature. On irritating the nerve on the proximal side of the ligature, the same convulsive movements followed; while no effect was observed from the irritation of the nerve on the distal side, or that in connection with the tongue and pharynx. The same difference in the results was also obtained from the irritation of the two ends of the nerve when cut across. We had in this dog an opportunity of contrasting the manner in which muscular movements are induced through the stimulation of a motor nerve, such as the hypoglossal, or the spinal accessory, with that motion which results from the excitation of a sensation, as appears to be the case when the glosso-pharyngeal is irritated. For while the stimulation of the hypoglossal and spinal accessory on the distal side of the ligature was followed by convulsive movements of the muscles to which they are distributed, and of these only, the stimulation of the glosso-pharyngeal on the same side of the ligature produced no visible effect. On the other hand, irritation of the hypoglossal and spinal accessory on the proximal side of the ligature excited no muscular movements whatever, while excitation of the glosso-pharyngeal on this side was followed by extensive movements in muscles, to the greater part of which it sends no filaments. When the glosso-pharyngeal was pricked with the forceps, the indications of suffering were distinctly but not strongly manifested, but the application of a tight ligature was evidently attended by intense pain,—an effect which we were somewhat surprised to find also attended the application of a tight ligature to the hypoglossal. * A fatal dose of prussic acid was given, and the muscles of the throat more fully exposed, when distinct convulsive movements of the constrictors of the pharynx were observed each time that the pharyngeal branch of the *par vagum* was pricked.

In dissecting the nerves after death, I was anxious to ascertain if any possible explanation could be given, why the convulsive movements attending the stimulation of the nerve should have been so feebly manifested on the side first operated on, and I ascertained that we had been experimenting on the nerve of this side beyond or on the distal side of the origin of nearly all its pharyngeal branches; while in the second operation we had been experimenting on the trunk of the nerve prior to, or on the proximal side of the origin of its pharyngeal branches. Dr Sharpey examined these dissections, and expressed himself satisfied with the accuracy of the statements here given.

Exp. VI.—The nerve was first exposed on the left side in a middle-sized terrier. On pinching the nerve the convulsive movements of the throat were rather feeble, though perfectly distinct. When proceeding to display the nerve on the right side we were joined by Professor Sharpey. We first pricked the lingual branch, by which I here mean the continuation of the trunk of the nerve proceeding to the tongue after giving off its pharyngeal branches, (under the belief that we were operating on the entire trunk) and neither convulsive movements, nor indications of suffering followed. On dissecting the trunk of the nerve backwards towards the *foramen lacerum*, and beyond the origin of the pharyngeal branches, distinct convulsive movements of the muscles of the face and throat, and decided indications of suffering were observed. On pricking the nerve during the moaning of the animal, it was several times remarked that the voluntary actions of the muscles of the throat were interrupted by these convulsive starts.

---

* Mayer has described a small ganglion on the root of this nerve in the dog and ox. He has seen it once in the human subject.—See Edin. Med. and Surg. Journ. Vol. xliii. p. 486.

This animal was killed a few days after, and it was ascertained that while the nerve had been satisfactorily divided on one side, one pretty large pharyngeal branch had been left on the other. Dr Sharpey also examined this dissection, and was fully satisfied of its accuracy. The impression on my mind is, that this pharyngeal twig was found on the left side, (the side first operated on,) but as it is not expressly stated in my notes, I cannot positively affirm it.

Exp. VII.—On exposing the glosso-pharyngeal nerve in a stout terrier bitch, we found that irritation of the lingual branch was attended by no visible muscular movements, and no decided indication of suffering; while on irritating some of the small pharyngeal filaments individually, which leave the trunk of the nerve soon after it leaves the *foramen lacerum*, convulsive movements of the muscles of the throat and face, and marked indications of suffering followed.

It will be unnecessary to detail the results of the other ten experiments which were performed to ascertain the effects of irritating this nerve, as far as the indications of muscular movements and common sensation are concerned. I may state, however, that the facts detailed in the above experiments were amply confirmed by those which were subsequently performed. It was found that the muscular movements excited by pinching this nerve varied in degree in different animals, but were always distinctly marked when the precaution was taken to irritate the nerve before it had given off its pharyngeal branches. It was also repeatedly observed, that when the nerve was cut across, irritation of the lower end, or that in connection with the muscles, was followed by no movement; while, on the other hand, irritation of the cranial end, even when the nerve was divided before it had given off a single twig, was followed by as powerful convulsive twitches as when the nerve was entire. We also remarked more than once, that while the pinching of the lingual branch caused no muscular movements, irritation of one of the small pharyngeal twigs was followed by very strong convulsive twitches of the throat and lower part of the face. The capability of this nerve to transmit those impressions which excite *sensation*, was amply proved by the severe and undoubted indications of suffering which in many cases followed the pinching of it with the forceps. In several cases, however, the indications of suffering were much less strongly marked than in others, but that this nerve possesses *common sensation*, in the usual acceptation of that term, I am fully convinced, not only from the results of these seventeen experiments expressly made upon these nerves, but from five others, where they were exposed in displaying the pharyngeal branches of the *par vagum*. That irritation of the trunk of the glosso-pharyngeal nerve is attended by convulsive muscular movements and indications of suffering, is in direct opposition to the statements of Panizza,* Dr M. Hall, and the late Mr Broughton,† and is in accordance with those of Dr Alcock‡ of Dublin. I was at first fully convinced that these experimenters had been operating on different nerves, though it was difficult to conceive how such mistakes could arise in the hands of those so much accustomed to researches upon the nervous system. The details of Exps. V. VI. and VII. will, I think, however, explain how such discrepancies should arise, without seriously impugning the anatomical knowledge or acuteness of observation of either party. For though I do not mean to affirm that pinching the lingual portion of the nerve is never followed by indications of suffering, (for from the irregularity in the origin of the pharyngeal twigs, and the difficulty of judging at the bottom of a deep wound, at what particular part these are all given off, it is generally impossible to decide when the lingual portion of the nerve may be said to begin,) yet I have no hesitation in saying, that if in these three experiments, and in others not detailed here, we had operated on that part of the trunk of the nerve which first presented itself, and not proceeded to dissect it back towards its place of exit from the cranium, we should have gone away with the impression that the irritation of this nerve was followed by no muscular movement, and little if any indications of suffering. Dr Alcock § suggests that Panizza may have experimented upon the superior laryngeal branch of the *par vagum*, instead of the glosso-pharyngeal; but we can scarcely believe that an accurate anatomist like Panizza could commit such an error. Besides, in repeated experiments upon the laryngeal nerves (as we shall afterwards more particularly mention,) we found, in all the animals operated on, except two dogs which appeared considerably exhausted by great previous suffering, ample grounds for dissenting from the statements of Dr Alcock, that this nerve is devoid both of sensibility and of muscular influence. With the exceptions mentioned, very severe indications of suffering, and in a few cases also distinct muscular twitching of the neck and face attended the pinching and cutting of this nerve. These muscular twitchings, however, were certainly not so frequently observed nor so well marked as those we witnessed from pinching the glosso-pharyngeal.

---

* Edinburgh Medical and Surgical Journal, Vol. xlv. p. 86.

† Dr M. Hall and Mr Broughton in Vol. iv. p. 679, of British S. Association, also Mr Broughton in Vol. xlv. of Edin. Medical and Surgical Journal, p. 429.

‡ Dublin Journal of Medical Science, Vol. x. p. 260.

§ Op. cit. p. 266.

Can these muscular movements attending the irritation of the trunk of the glosso-pharyngeal nerve arise partly or wholly from the development of one of those impressions which, when conveyed by the sensitive filaments to the central organs of the nervous system cause some influence to be transmitted along certain other motor nerves, by which particular muscles are called into action,—in the same manner as irritation of the trunk of the optic nerve, causes contraction of the iris, and compression of the trunk of the *par vagum* in the neck not unfrequently produces violent movements of the respiratory muscles? Or can it be that these muscular movements depend partly or wholly upon the irritation of the nerve acting directly through its motor filaments upon the muscular bundles to which they are distributed,—in the same manner as pinching of the hypoglossal causes convulsive movements in the muscles of the tongue? Dr Alcock is doubtful on this point. Though "disposed to regard the result in question as the effect of a sentient impression excited through the nerve, and referred to the interior of the pharynx," from the fact, that this movement extends to muscles not supplied by this nerve, and forms an associated action, he yet admits, "that the circumstance may be as well explained by an exalted degree of muscular excitement, or by a higher one than that necessary to produce the simple starting." * In the experiments which I have detailed above, we have, however, sufficient evidence to decide that these muscular movements can only be explained on the supposition that they depend upon some influence transmitted along other nerves distributed to these muscles, and through the intervention of the central organs of the nervous system. We there find, and the facts were still farther confirmed by what we observed in other experiments, that irritation of a single pharyngeal twig, or, what is still more conclusive, of the upper or cranial end of the cut nerve before it had yet given off any of its branches, was attended by as powerful convulsive movements, as when the trunk of the nerve and all its branches were entire and uninjured.

Is this nerve, then, entirely a nerve of sensation, or is it partly motor and partly sensitive?

Mr Mayo,† and Professor Müller‡ of Berlin, maintain that it is both a nerve of sensation and motion,—the former on physiological, the latter on anatomical grounds. "When the *glosso-pharyngeal* nerve," says Mr Mayo, "is pinched in an ass recently killed, a distinct convulsive action ensues, apparently including and limited to the *stylo-pharyngeus* muscle, and the muscular fibres about the upper part of the *pharynx*." I have already stated in the above experiments that no muscular movements were observed on irritating the lower end of this nerve, when cut across. I attach, however, little weight to this observation, since it was but rarely possible to see distinctly the contractions of the constrictors of the pharynx, from the imperfect manner in which these muscles were exposed in operating on the living animal. As it is agreed, that when a motor nerve is irritated immediately after death, and while the muscular contractility is still vigorous, the muscles to which it is distributed are thrown into contraction, I proceeded, therefore, as in the above experiment by Mr Mayo, to satisfy myself on this point. These experiments were made upon ten dogs, the nerves being exposed immediately after death, and the irritation of the pharyngeal branch of the *par vagum* was always taken as a test that the muscular contractility was still in sufficient vigour to be readily excited through the motor nerves, and also a standard of comparison. I cannot say that the results of these experiments were uniform, but I am convinced that in none of them was there any satisfactory evidence to lead us to believe that the glosso-pharyngeal is a nerve of motion; and I am perfectly satisfied, that in all of them, which were quite accurately performed, no muscular movements were seen on irritating this nerve. As the experiment is one which requires great care in its performance, and is liable to a marked source of fallacy from the intimate connection of the nerve with another, viz. the pharyngeal branch of the *par vagum*, which is undoubtedly a nerve of motion, I shall relate some of the experiments which illustrate this. Before doing this I may again more particularly refer to the relative position of these two nerves to each other, since this is not mentioned, as far as I am aware, by any previous experimenter. The trunk of the *pharyngeal branch of the par vagum* lies, as we have already stated, quite close to that of the *glosso-pharyngeal*. It divides into ascending and descending branches, the ascending branch (or branches) which passes to the superior constrictor and muscles about the isthmus of the fauces, runs generally immediately behind the trunk of the glosso-pharyngeal for a short distance, and may remain merely in close apposition, or form a free anastomosis with it. Very frequently the trunks of the two nerves anastomose by a short branch a little anterior to the *foramen lacerum*, in which case it generally requires a careful dissection to show that the large descending twig of the pharyngeal branch of the *par vagum* is not a part of the glosso-pharyngeal nerve. In one case which I dissected lately, a communicating branch connected the trunk of the two nerves, before they had fairly cleared the *foramen lacerum*. It is absolutely necessary to have these facts impressed upon the mind, before any satisfactory experiments can be made upon the glosso-pharyngeal, with the view of ascertaining whether it is a motor nerve or not.

---

* Oper. cit. p. 265.

† Anatomical and Physiological Commentaries, No. ii. p. 11.

‡ Archives für Anatomie, Physiologie, &c. No. ii. p. 275. 1837. Von Dr J. Müller.

Exp. VIII.—The *glosso-pharyngeal nerve*, *pharyngeal branch of the par vagum*, and *constrictor muscles* of the *pharynx*, were exposed in a middle-sized mongrel, immediately after it had been deprived of sensation by a dose of prussic acid. On pinching the trunk of the glosso-pharyngeal nerve no muscular movements were observed; while on pinching the *pharyngeal branch* of the *par vagum*, immediate and powerful convulsive movements of the *constrictor muscles* of the *pharynx* followed. This was repeated several times on both sides with the same results.

The same phenomena were witnessed in two other dogs, with this additional observation in one of them in which the anterior part of the pharynx was opened, that the muscles about the *isthmus* of the *fauces* as well as the *constrictors* of the *pharynx* were thrown into action on pinching the *pharyngeal branch* of the *par vagum.*

Exp. IX.—The *glosso-pharyngeal*, *pharyngeal branch* of the *par vagum*, and *constrictors* of the *pharynx*, were exposed in a young terrier immediately after a fatal dose of prussic acid had been given. On pricking the glosso-pharyngeal no effect followed, while convulsive movements of the constrictors of the pharynx were very apparent on pricking the pharyngeal branch of the *par vagum.* The wires of a pretty powerful galvanic trough were then applied, and it was observed that when proper precautions were taken to insulate the glosso-pharyngeal, so as to avoid the passage of a current through the muscles, no movement was seen, while very powerful convulsive movements of the *pharynx* attended each application of the wires to the *pharyngeal branch* of the *par vagum.* The nerves of the opposite side were then exposed. At the first application of the galvanic wires to the glosso-pharyngeal no movement followed. On repeating the application, slight irregular movements were observed in the middle *constrictor*, where many of the *pharyngeal* branches of the glosso-pharyngeal seem to plunge themselves. The same extensive and vigorous movements, as were observed on the opposite side, followed each application of the wires to the *pharyngeal branch* of the *par vagum.* We were afterwards satisfied that the slight convulsive motions seen on irritating one of the glosso-pharyngeal nerves in this experiment, could be accounted for by the transmission of a slight current through the muscle, for in this case the trunk of the nerve was not cut across, but merely raised on an aneurism needle. Now Mr K. T. Kemp (whose practical acquaintance with every thing relating to galvanism is well known) to whom I referred the question, stated to me that it was perfectly possible, nay probable, that a part of the galvanism generated by a battery of twelve double plates, each five inches square, such as was used in this experiment, would, instead of passing across between the two wires, take the more circuitous course along the circle, which was formed through the muscle by the conducting nerve and cellular tissue. In fact, we had demonstrative evidence that such was the case in this experiment, for my friend Dr J. Duncan, pointed out at the time, that if the aneurism needle was allowed to touch the sterno-mastoid muscle, strong convulsive movements of this muscle were excited, though the needle was placed under the nerve a little posterior to the part where the wires were applied.

Exp. X. — The *glosso-pharyngeal nerve*, *pharyngeal branch* of the *par vagum* and *constrictor muscles* of the *pharynx* were exposed in a young dog immediately after it had been deprived of sensation by a fatal dose of prussic acid. Distinct convulsive movements of the muscles of the pharynx were seen when the pharyngeal branch of the *par vagum* was pricked by the forceps; no visible movement when the glosso-pharyngeal was similarly treated. The nerves were then cut across, and galvanism applied with the same results. The same observations were made upon the nerves of the opposite side. Dr Alison was present at this experiment.

Exp. XI.—The *nerves* and *constrictor muscles* of the *pharynx* were exposed on one side in a middle-sized dog, immediately after it had been killed. Pinching the *glosso-pharyngeal*, was followed by convulsive movements of the upper part of the constrictors of the pharynx, and stylo-pharyngeus muscle, but on separating a large twig of the pharyngeal branch of the *par vagum* which lay below it, and which was also embraced by the forceps, no effect followed from irritating the *glosso-pharyngeal* alone. Pinching the pharyngeal branch of the *par vagum* was followed by vigorous movements of all the *constrictors* of the *pharynx* and *stylo-pharyngeus* muscle. The same observations were repeated on the opposite side.

In two other experiments convulsive movements in the *stylo-pharyngeus* muscle and *upper part* of *pharynx*, such as was observed by Mr Mayo in the ass, followed the pinching of the *glosso-pharyngeal*; but in these the nerves had been cut through hurriedly, and when covered with blood, so that it was afterwards impossible to say whether the large ascending twig of the pharyngeal branch of the *par vagum* was included along with the glosso-pharyngeal or not. The movements observed were such as in other cases attended the irritation of that twig of the pharyngeal branch of the *par vagum*. Recalling to my recollection these facts, and the result of Exp. XI., I determined to repeat my observation in a more accurate manner.

Exp. XII.—The nerves and pharyngeal muscles were exposed in a large Newfoundland dog, after receiving a poisonous dose of prussic acid. The glosso-pharyngeal nerve was cut across and galvanism applied, but this was so close to the communicating twig of the pharyngeal branch of the *par vagum*, that no accurate observations could be made. The nerve was then rapidly but carefully displayed on the opposite side without disturbing it, and it was observed that when it was' pricked with the forceps posterior to, or on the proximal side of the point where it was joined by the communicating branch, so often mentioned, no movement resulted: on the other hand, the application of the forceps at a certain distance anterior to or on the distal side of this junction, was followed by convulsive movements of the upper part of the pharynx. On irritating the pharyngeal branch of *par vagum*, rapid and vigorous movements of all the pharyngeal muscles and upper part of the œsophagus followed.

Exp. XIII.—The difference betwen the effects of irritating the *glosso-pharyngeal*, anterior and posterior to the junction of the communicating branch, was also observed in this experiment performed upon a young dog. The same extensive movements of the *constrictors* of the *pharynx* and upper part of *œsophagus* were again witnessed on pricking the *pharyngeal branch* of *par vagum*. On opening the anterior part of the *pharynx*, these movements were also seen to extend to the muscles of the isthmus of the fauces and soft palate, as indicated by the motions of those parts. Irritation of the *glosso-pharyngeal* was again repeated when the *pharynx* had been opened, but still no muscular movement could be detected.

The preceding experiments appear to me sufficient to prove that the glosso-pharyngeal cannot be considered a motor nerve. I am perfectly aware that negative are infinitely less conclusive than positive experiments, and that one well-ascertained positive will outweigh a whole host of negative experiments, so that if I had been satisfied even in one of the ten experiments that muscular movements followed the irritation of the glosso-pharyngeal, when fairly insulated from the pharyngeal branch of the *par vagum*; or if these experiments did not furnish a sufficiently plausible explanation of the cause of the discrepancy between these results and those obtained by Mr Mayo upon the ass, I must have been compelled to admit that the glosso-pharyngeal was also a motor nerve, though to a limited extent. The conclusions I have formed regarding the difference in function between the glosso-pharyngeal and pharyngeal branch of the *par vagum* are also greatly supported by their ultimate distribution upon the *pha-*

rynx and *fauces*, as I shall afterwards point out when we come to the consideration of the functions of the pharyngeal branches of the *par vagum*.

With regard to the argument in favour of the motor properties of this nerve, drawn by Müller from its anatomy, it appears to me that this analogical mode of investigation, valuable though it be, must be permitted to yield to the more positive observations obtained from experiments. Of the existence of the *ganglion jugulare N. glosso-pharyngi*, which was first pointed out by Ehrenritter,[*] and more lately described by Müller;[†] and of its apparent limitation to the posterior filaments of the nerve, I am fully convinced from actual examination. And though it must be granted that this nerve here resembles very closely the double roots of the spinal nerves, yet we must be wary in drawing analogies between the glosso-pharyngeal and the spinal nerves, for we have another ganglion situated immediately below this, viz. the *ganglion petrosum* of Andersch, which involves the whole trunk of the nerve; and to this assuredly we have no analogical structure in the spinal nerves, if we admit that the superior ganglion resembles those upon their posterior roots. Müller no doubt supposes that this inferior ganglion differs from those placed upon the posterior roots of the spinal nerves, and that it belongs to the sympathetic system. But as nothing like conclusive proof is advanced in support of this opinion, we may, in the meantime, reasonably suspend our belief as to the probable influence which this lower ganglion may exert upon the functions of the nerve.[‡]

Since, then, we are led to believe that the glosso-pharyngeal is entirely a nerve of sensation, and that the muscular movements which result from its irritation depend not upon any influence extending downwards along the branches of the nerve to the muscles moved, but to a reflex action exerted through the medium of the central organs of the nervous system, we have next to inquire whether or not these muscular contractions resemble any of the instinctive associated muscular movements concerned in the Function of Deglutition. It appeared to Dr Alcock that they strictly resembled the associated movements which are "ordinarily excited by a disagreeable sensation experienced in the fauces and pharynx."[§] There is little doubt that the muscles thus thrown into action are those concerned in regulating the course of the ingesta along the pharynx; but I have not, after very frequent opportunities of carefully watching this movement, been able to satisfy myself that it resembled very closely any of the associated movements usually engaged in this function. If asked, however, to which of them it most nearly approximated, I would say, to a rapid act of deglutition, with this difference, that in the action of deglutition there is much more extensive movements of the larynx and lower part of the pharynx indicated by the ascent and subsequent descent of the hyoid bone and thyroid cartilage. I endeavoured in several of the experiments, by gently pricking, pulling, and pinching the nerve, to produce the more slow and usual effects of deglutition, or of those "excited by disagreeable sensations in the fauces and pharynx," but without success. From what I have already said it appears that the excitation of these extensive muscular movements is connected with the *pharyngeal portion* of the nerve, and under the term pharyngeal, I here include a great part of the filaments going to the fauces. I am satisfied that this phenomenon is essentially different from one of those rapid involuntary muscular movements not unfrequently produced by the sudden excitation of pain. I have watched the effects of cutting and otherwise irritating some of the superficial nerves of the cervical plexus which are exposed in displaying this nerve, and I am convinced that they cannot be classed under the same head. The muscular movements of the throat and face observed on irritating the glosso-pharyngeal were sometimes as well marked when the animal was otherwise quiescent, as when also attended by the general struggles of the animal. We believe, then, that these pharyngeal filaments possess specific endowments connected with the peculiar sensations of the mucous membrane, upon which they are distributed, though we cannot pretend to speak positively in what these consist. The apparent difference in the endowments of the *pharyngeal* and *laryngeal* branches might readily suggest some speculations upon the differences in the sensations of those portions of the mucous surface upon which they are ramified, but from these we at present abstain.

---

[*] Tiedmann's Zeitschrift für Physiol. Vol. ii. p. 176.

[†] Arch. für Anat. und Physiol. 1834. p. 11.

[‡] Is it possible that the filaments which do not pass through the ganglion jugulare can be connected with the specific sensations of the fauces and pharynx?

[§] Op. cit. p. 264.

The next subject of inquiry which naturally presents itself is, what effect has section of the glosso-pharyngeal nerve upon the *functions of deglutition?* I certainly supposed, after witnessing these extensive movements of the muscles of the throat and lower parts of the face, excited by irritation of the glosso-pharyngeal, that upon this nerve must depend those sensations of the fauces and pharynx which give rise to the associated movements of deglutition. I therefore fully anticipated that section of this nerve would seriously interfere with the proper performance of these functions; and it was only after I could no longer resist the facts ascertained by my subsequent experiments, that I reluctantly abandoned the idea. The chief embarrassment experienced in arriving at satisfactory results on this point, was the great difficulty of dividing the nerve before it had given off any of its branches. To display the trunk of the nerve became to us a comparatively easy process; but to cut it close to the *foramen lacerum*, and before it had given off any of its twigs, remained to the last a matter of great perplexity. It was only after repeated failures that we fairly succeeded in effecting this on both sides, and I was never fully satisfied that the nerves were satisfactorily divided, until I had carefully dissected the parts after the death of the animal. After we had succeeded in exposing the trunk of the nerve, and traced it back to the neighbourhood of the *foramen lacerum*, it was always necessary to proceed with great caution, as it here lies in close apposition with the trunks of the *par vagum*, spinal accessory, hypoglossal, and the sympathetic; and when to the difficulty of separating parts thus placed so closely to each other, and lying at the bottom of a deep wound, we add the obscurity so frequently arising from the blood poured out from the division of the numerous small vessels surrounding these nerves, and the frequent and violent struggles of some of the animals whenever the glosso-pharyngeal was seized by the forceps; some notion may be formed of the difficulty of succeeding in this attempt. I ascertained that several of the animals in which all the branches of the nerve had been fairly divided, except one or two of the small twigs going to the pharynx, could nevertheless swallow perfectly in from ten days to a fortnight, in other words, after the pain and swelling arising from the incisions had considerably abated. As, however, I had seen equally vigorous muscular movements excited by pinching one of the *pharyngeal twigs*, as from the trunk of the nerve itself, I considered these unsatisfactory. In three dogs, which lived long enough after the perfect section of the trunk on both sides, to enable me to make decisive observations, the power of swallowing was perfectly retained. The most satisfactory of these I shall here shortly detail.

Exp. XIV.—The glosso-pharyngeals were divided in a middle-sized young terrier. This animal recovered rapidly from the effects of the operation, and a few days after it swallowed small morsels readily. Ten days after it swallowed large masses with great facility, notwithstanding the wounds in the neck were still open. Fourteen days after the operation it was repeatedly tried with morsels of various sizes, and there could be no doubt that he swallowed large masses quite readily and as perfectly as ever he did. These observations were again repeated to the perfect satisfaction of all those present. It was then killed, and a careful dissection made of the nerves experimented on. The upper cut ends of the glosso-pharyngeal nerves were found lying within the *foramen lacerum*, and not a single filament arose from either nerve above the point where they had been divided. More than an inch of each nerve had been removed. This last experiment, being a positive one, is alone sufficient to decide, independent of the other two which I might also detail, that the glosso-pharyngeal is not the sole nerve upon which the sensations of the fauces and pharynx necessary to the act of deglutition depend, though I believe there can be little doubt, both from its extensive distribution upon the mucous surfaces of these parts, and from the evidence afforded by the experiments upon the effects of pinching its pharyngeal branches that it must be concerned in exciting those sensations. Other nerves of sensation are distributed upon these surfaces, viz. the descending palatines of the second branch, and a few filaments from the lingual portion of the third branch of the fifth, upon the mucous membrane of the *soft palate* and *isthmus* of the *fauces*; and branches of the *laryngeal* nerves, but principally of the *superior laryngeal* upon the mucous membrane of the *pharynx*. What would be the result of cutting all these nerves, I have not yet attempted to ascertain, but having first satisfied myself that section of the *superior laryngeals* does not interfere with the act of swallowing, I performed the following experiment.

Exp. XV.—Both the *glosso-pharyngeals* and *superior laryngeal* branches of the *par vagum* were cut in a stout terrier dog. Shortly after the operation he swallowed several pretty large morsels of animal food quite readily. Next day he also swallowed two or three pretty large morsels in such a manner as to satisfy me, that if the swelling and inflammation were subdued, his powers of deglutition would not be impaired. On the third day he was seized with pneumonia, and died before any other accurate observations could be made. On dissection, these two nerves were found to be satisfactorily divided on both sides. This experiment was repeated upon another dog, but this animal died two days after, without even attempting to swallow. I, however, feel so confident, from what I saw in the first dog, that the section of both these nerves would not affect the associated movements of deglutition, that I have not thought it necessary to repeat the experiment The inference to which these experiments naturally lead us, is, that when the palatine branches of the fifth pair are uninjured, these are sufficient of themselves to furnish the sensations upon which the associated muscular movements of deglutition depend.

The results thus obtained regarding the effects of section of the glosso-pharyngeal upon the function of deglutition differ considerably from those observed by Dr Alcock, for, according to that gentleman, in those instances in which the nerve was perfectly divided "the deglutition was so much interfered with as in some cases to be impossible,"—"it (the animal) often experienced so much difficulty as to become much exhausted, or to seem even in danger of suffocation before it succeeded."* The experiments which I have detailed above, are sufficient to show that these effects are not the necessary consequence of the perfect section of these nerves. And as the results obtained by Dr Alcock were only observed by me when the *pharyngeal* branch of the *par vagum* was divided, never when it was left uninjured; and as I shall afterwards show, that the section of this nerve alone is sufficent to produce these effects, I am irresistibly led to conclude that this gentleman must have divided that nerve along with the glosso-pharyngeal. Indeed this might be inferred from his own words, for in criticising the experiments of Panizza, and attempting to point out the sources of error by which he supposes he must have been misled, Dr Alcock describes the glosso-pharyngeal in such a manner, as to leave no doubt in my mind, after frequent and careful dissection of the parts, that his *pharyngeal* branch of the glosso-pharyngeal is really the *pharyngeal* branch of the *par vagum*. As I have already pointed out, the relation of these two nerves to each other is so close, that it is only by frequently tracing them to their origin, that we are able to distinguish them readily in all cases.

It is unnecessary to state how much these experiments are at variance with the opinion of Sir C. Bell, that the function of this nerve is to associate the movements of the tongue and pharynx with the muscles of respiration in the instinctive movements of deglutition. It is obvious from the experiments already and to be subsequently mentioned, that these associated movements of the *tongue* must depend upon the *hypoglossal*, and those of the *pharynx* upon the *pharyngeal branch* of the *par vagum*. Mr Shaw states,† "that the powers of this nerve over the pharynx has been shown by several experiments, the results of which are very curious, and corroborative of the views (viz. of combining the movements of the tongue and pharynx) deduced from comparative anatomy." What these experiments were we are not informed; but it must be obvious from those related above, that the derangements of these movements were not necessarily connected with lesion of this nerve. Besides, the anatomical fact, that the lingual portion of this nerve is distributed entirely, or almost entirely, to the mucous surface of the tongue, is sufficient to entitle us to call in question its alleged motor powers over that organ, if it is supposed by the supporters of this opinion to act as a motor nerve.

We have lastly to inquire in what manner the section of the glosso-pharyngeal nerve affects the Sense of Taste. My observations on this head are in perfect accordance with those of Dr Alcock. Dr Alison had an opportunity of witnessing the persistence of the sense of taste in one of the dogs, after a portion of the trunk of the nerve on both sides had been removed, and Dr Sharpey was perfectly satisfied that the animal, the subject of Exp. VI. was sufficiently sensible of disagreeable impressions upon this sense. And though in the case witnessed by Dr Alison a few pharyngeal filaments, and in that witnessed by Dr Sharpey one pharyngeal twig on one side, were found to have been left uncut, yet it was obvious that the rejected morsel sprinkled with coloquintida was fully recognized before it passed beyond the anterior part of the mouth I need not add, that the lingual portion of the nerve was fully divided in both of these cases. The remark, however, was repeatedly made, (and it is of importance, as explaining the error of Panizza on this point,) that if animal food was offered, and the dog very hungry, he would eat the morsel containing the coloquintida rather than lose it; though he refused it if he saw any prospect of procuring another free from the bitter. The subject of Exp. I., in which, as was stated, the glosso-pharyngeal was cut on one side only, even eat readily several pieces of bread dipt in a strong infusion of gentian root. Lest any doubt may arise that the presence of a few pharyngeal branches could have influenced the sense of taste, I may adduce the subject of Exp. XIV., to prove that when the nerve is divided before it has given off a single filament, still the animal retains a sufficiently acute perception of disagreeable savours. I have fed that dog with morsels of animal food from my hand; and after he had taken several morsels in this way, which he readily swallowed, I then presented a morsel similar in size to the others, and with the coloquintida concealed in a way that he could not see it, but no sooner was it taken into the mouth, than it was rejected with evident symptoms of disgust. This was repeated more than once. I find that Müller in the second No. of his Archives for this year (1837) states that some experiments were performed in Berlin, in the summer of 1836, by a Dr Kornfeld, in which persistence of the sense of taste was ascertained after section of this nerve. It is very probable, nevertheless, that this nerve, though not the special nerve of the sense of taste, as supposed by Panizza, Dr M. Hall and Mr Broughton* may yet participate in this function, along with the lingual portion of the third branch, and the palatine twigs of the second branch of the fifth pair. This view is not only supported by the anatomical fact, that the mucous membrane and papillæ of the tongue, for about an inch in front of the *foramen cæcum*, are almost entirely supplied by this nerve, but also by the experiments of Dr Alcock † I endeavoured to ascertain the state of the sensibility, and of the sense of taste in that portion of the tongue where this nerve is ramified, after the trunk had been divided on both sides; but from the restlessness and struggles of the animals, I was unable to arrive at any satisfactory results.

---

* Oper. cit. 261.

† London Medical and Physical Journal, Vol. xlix. p. 453.

---

* Sixth Report of British S. Association.

† Op. cit.

From a review of all the experiments which I have performed upon the *glosso-pharyngeal nerve*, I am inclined to draw the following conclusions:

1. That this is a nerve of *common sensation*, as indicated by the unequivocal expression of pain by the animal, when the nerve is pricked, pinched, or cut.

2. That mechanical or chemical irritation of this nerve before it has given off its pharyngeal branches, or of any of these branches individually, is followed by extensive *muscular movements* of the throat and lower part of the face.

3. That the muscular movements thus excited, depend, not upon any influence extending downwards along the branches of the nerve to the muscles moved, but upon a *reflex action*, transmitted through the central organs of the nervous system.

4. That these *pharyngeal branches of the glosso-pharyngeal* possess endowments connected with the *peculiar sensations* of the mucous membranes upon which they are distributed, though we cannot pretend to say positively in what these consist.

5. That this cannot be the sole nerve upon which all these sensations depend, since the perfect division of the trunk of the nerve on both sides does not interfere with the perfect performance of the *function of deglutition*.

6. That mechanical or chemical irritation of the nerve, immediately after the animal has been killed, is not followed by *any muscular movements*, when sufficient care has been taken to insulate it from the *pharyngeal branch of the par vagum*. And we here again observe an important difference between the movements excited by irritation of the *glosso-pharyngeal* and those of a motor nerve. For while the movements produced by the irritation of the *glosso-pharyngeal* are arrested as soon as the functions of the central organs of the nervous system have ceased, those from irritation of a motor nerve, such as the *pharyngeal branch of the par vagum*, continue for some time after this, and when all connection between it and the *medulla oblongata* has been cut off.

7. That after perfect section of the nerve on both sides, the *sense of taste* is sufficiently acute to enable the animal readily to recognize bitter substances.

8. That it probably may participate with other nerves in the performance of the function of taste, but it certainly is not the special nerve of that sense.

Lastly, the *sensation of thirst*, which is referred to the *fauces* and *pharynx*, does not appear to depend entirely upon the presence of this nerve. The animals in which it was divided lapped water of their own accord. I observed one of them in which the nerves were found satisfactorily divided, rise, though very feeble, walk up to a dish containing water, lap some of it, and return again to the straw upon which he was previously lying.

To Dr J. Duncan and Mr J. Spence, I am most deeply indebted for their valuable assistance in the performance of these experiments upon the glosso-pharyngeal nerve and the greater part of those which are to follow. It is obvious, that without the aid of active and intelligent assistants, it would have been perfectly impossible to have proceeded with such an investigation. These two gentlemen witnessed the facts stated in the preceding experiments, and I have their sanction for their accuracy.

PART II.—*Pneumogastric Nerve.*

I shall first consider the immediate effects of the mechanical and chemical irritation of that part of the trunk of this nerve which lies in the neck, and then proceed to the separate investigation of the functions of its *pharyngeal*, *laryngeal*, *œsophageal*, *cardiac*, *gastric*, and *pulmonary* branches.

I have exposed the trunk of the *par vagum* in the neck in at least thirty animals, and in almost all of these, the pinching, cutting, and even the stretching of the nerve were attended by *indications of severe suffering*. It was frequently difficult to separate the nerve from the artery, on account of the violent struggles of the animal, though some of them had been pretty quiet during the previous part of the operation. It has appeared to me, however, that a considerable degree of stretching and even compression may in many cases be exercised, without exciting any apparent suffering, when these are gradually applied. And this may perhaps account for the statement of Dr M. Hall and Mr Broughton,* that " in pinching the *par vagum* neither of the phenomena above-mentioned (viz. sensibility and muscular movements) occurs." Very few of the numerous experimenters upon the *par vagum* say any thing about the sensibility of this nerve, apparently, because their investigations were almost always conducted with a view to ascertain the effects of its section upon the circulatory, respiratory, and digestive functions. I find, however, that Haller, in some experiments expressly undertaken for the purpose of ascertaining the degree of sensibility possessed by the nervous trunks, observed unequivocal signs of suffering on injuring the pneumogastric nerves. In relating an experiment upon a rabbit, he says, "Utcunque nervorum octavi paris, resecuimus, miseris cum doloribus, et contorsionibus animalculi."* Again, in describing the effects of the application of a ligature upon these nerves in another rabbit, it is mentioned, "ejulavit inter vinciendum miserum animal."† Brunn, in detailing several experiments upon the effects of including the *par vagum* in a ligature, describes the animals as giving undoubted evidence of feeling pain.‡ Dupuy states, in giving the details of one of his experiments, that "l'animal témoigna beaucoup de douleur pendant la division du nerf.§ Dumas also, in relating an experiment upon this nerve, informs us, that when "on passe ensuite une ligature autour du nerf pneumogastrique; il témoigna par ses mouvements et par ses cries la vivacité de sa douleur."‖ It is stated by Dr M. Hall and Mr Broughton,¶ that when the compression of this nerve is continued "for a few moments, an act of *respiration and of deglutition follows, with a tendency to struggle and cough.*" I have frequently repeated this experiment; and though in some of the animals powerful respiratory movements were produced by compressing the nerve, which were soon followed by struggles, yet I have never observed either any tendency to cough or any act of deglutition, which I could fairly refer to this cause. The most satisfactory of these experiments I may here shortly relate.

---

* Reports of British S. Association, Vol. iv. p. 677.

Exp. XVI. The pneumogastric nerves were exposed in a middle-sized mongrel dog. On laying hold of the nerve with the forceps, rather gently at first, but soon increasing the pressure so as to squeeze it pretty firmly, no effect was observed for a few seconds, but the breathing then became somewhat heaving, with a noise resembling snoring. This was repeated twice on each nerve, and always with the very same effects. The struggles attending the compression of the nerve in this animal were very slight.

Bichat contends that the increased respiratory movements accompanying the irritation of the *par vagum* depend solely upon the sudden excitation of pain.** Unquestionably the sudden infliction of pain hurries the respiration; but I believe that there can be no doubt that Bichat was in error, when, to this circumstance alone he attributed all the increased respiratory movements observed on irritating the pneumogastric nerves. In case it may be argued that these increased respiratory efforts arise from the partial arrestment of the movements of the glottis consequent upon compression of one of these nerves, I may state that I have seen them in two cases when the animal was breathing through a large opening in the trachea. That these increased respiratory movements are not dependent upon any direct effect which irritation of this nerve has upon the lungs or thoracic muscles, is proved by the fact, that when the nerve is cut across, the irritation of the portion in connection with the *medulla oblongata* alone excites these movements.

---

* Opera Minora, Tom i. p, 360. Exp. 136. Laus. 1762.

† Oper. cit. Tom i. p. 359. Exp. 132.

‡ De Ligaturis Nervorum, Ludwig, Tom ii. Scrip. Nov. Min. Scl. p 285–6–7.

§ Journal de Medecine, Chirurg. &c. Dec. 1816. p. 359. Exp. iv.

‖ Journal Géneral de Médecine, Tome xxxiii. p. 356.

¶ Oper. cit. 677.

** Sur la Vie et la Mort, p. 316, 2d ed.

Before proceeding to the consideration of the function of the pharyngeal branches of the *par vagum*, I may here briefly advert to the effects of section of the *par vagum* upon the conjunctival membrane of the eye, when practised upon those animals in which the sympathetic is so closely connected to this nerve, that the one cannot be divided without the other. I had several opportunities of witnessing these on dogs. At a longer or shorter period, after the trunks of the *par vagum* and the accompanying sympathetic nerves were divided, the conjunctiva became red, swollen, and projected over the cornea. The pupil was contracted, and only a small part of the ball of the eye was seen between the half-closed eyelids. This inflammation frequently went on to the secretion of purulent matter, and after lasting some time began gradually to abate. Petit was the first who observed these effects upon the eye after the section of the *par vagum*, and justly attributed them to the division of the trunk of the sympathetic; for he was perfectly aware of the connection of this nerve with the sixth pair and first branch of the fifth pair within the cavernous sinus, and of the intimate relation of the trunk of this nerve with that of the *par vagum* in the neck in quadrupeds. * Cruickshank also noticed this inflammation of the conjunctiva in his experiments upon the *par vagum*. In the first of these it is mentioned that there was "heaviness and slight inflammation of the eye," and in Exp. II., III., and IV., "the eyes," we are told, "became instantly red and heavy." †

That Petit was right in supposing this inflammation of the eye to arise from section of the sympathetic and not of the *par vagum*, has been fully demonstrated by the experiments of Dupuy,‡ upon the effects of the removal of the superior cervical ganglion of the sympathetic. These experiments have been more lately confirmed by Brachet.§ This inflammation of the eye frequently takes place with great rapidity after section of the sympathetic. In one case,

---

* Memoire dans lequel il est demontré que les Nerfs Intercostaux fournissent des rameaux, qui se portent les esprits dans les Yeux; dans l'Histoire de l'Academie Royale des Sciences, Année 1727.

† Philos. Transact. 1795, Part 1st, or Medical Tracts and Observations, Vol. vii. p. 136.

‡ Journal de Médecine, Chirurgie, &c. December 1816, Tome xxxvii. p. 340.

§ Fonctions du Système Nerveux Ganglionaire, Chap. ix. 1830.

I observed the conjunctiva reddened a very few minutes after the operation. In two of Petit's experiments, it is mentioned that in a quarter of an hour after the section of the nerves, the cartilaginous membrane, at the inferior angle of the eye, had encroached upon the cornea. In the fourth experiment by Dupuy upon the horse it is stated, "Aussitôt apres l'opération," the eyelids were swelled, and the eyes watery. This inflammation appears to be confined to the conjunctiva,—the contracted pupil and half-closed eyelids probably depending upon the impatience of light generally accompanying this condition. Petit mentions that he killed a dog on the third day after the operation, and on dissection found the inflammation apparently restricted to the conjunctiva. We do not, however, consider it fairly ascertained that the inflammation is confined merely to the surface of the eye. In the experiments of Dupuy and Brachet upon the effects of the removal of the superior ganglion of the sympathetic, to which I have referred, the same phenomena presented themselves, as far as the eye was concerned, as when the *par vagum* is cut in the neck. This inflammation of the conjunctiva from section of the sympathetic in the neck, cannot in all probability be referred to the same cause as that arising from section or disease of the fifth pair; the former occurring almost instantaneously, without arrestment of the usual secretion, and apparently from some direct effect upon the blood-vessels or their contents; the latter coming on more slowly, and apparently arising, as has been ingeniously suggested, from the arrestments of the usual secretions which protect the conjunctiva from the irritating effects of the external atmosphere, as seen in various cases when the nerves of secreting surfaces are cut.*

Pharyngeal branches of par vagum.—In the human species we not unfrequently find two pharyngeal branches of the *par vagum*, the lower and smaller of which, as Wrisberg describes, is composed of a filament of the *par vagum*, conjoined with others from the sympathetic. In the dog, (upon which the following experiments were made,) there is only one pharyngeal branch of the *par vagum* on each side as far as I have observed, and this is composed, as in the human species, of a twig from the internal branch of the spinal accessory, united with another twig from the *par vagum*.

These branches of the *par vagum* have not, as far as I am aware, been previously made the subject of experimental investigation, so that their exact functions have hitherto only been a matter of conjecture.

Is the pharyngeal branch of the *par vagum* both a *motor* and *sensitive* nerve? We have adduced sufficient evidence when detailing the experiments upon the glosso-pharyngeal, to prove that this is a motor nerve, for in repeated experiments made upon animals immediately after death, its mechanical and chemical irritation produced distinct convulsive movements of the muscles in which it is ramified. It is also there stated that the movements seen on irritating this nerve immediately after death are generally very vigorous, and embrace not only the *constrictors* of the pharynx and *stylo-pharyngeus*, but also the muscles of the soft palate. These facts are of themselves sufficient to entitle us to conclude that this is a motor nerve of these muscles; and if we are correct in inferring that the glosso-pharyngeal is entirely a nerve of sensation, we may proceed still farther in our inductions, and affirm that this is the principal, if not the sole motor nerve of these parts. * In experimenting upon this nerve in the living animal, it is best exposed in the manner described for displaying the glosso-pharyngeal. I find that I have notes of observations made upon the effects of pricking, cutting, and tying these nerves in seven dogs. In four of these it is expressly stated that there were not the slightest indications of suffering; in two, that there were no decided indications of suffering; and that in one, there was undoubted evidence of suffering, when these nerves were irritated in the manner mentioned. In all the seven animals, with the exception of the last, the difference between the results of pinching this nerve and the glosso-pharyngeal were very marked. It is quite possible that if this animal, instead of being kept alive for further observation, had been killed at the time, and the nerves carefully dissected, some unusual arrangements of the nervous twigs might have accounted for this difference; for in the other six the nerves were as I have stated, pricked, cut, and tied, and yet no decided evidence of the excitation of pain showed itself. I also distinctly remember, though I have made no mention of it in my notes taken at the time, that we pricked the trunk of this nerve, or its large descending branch in some cases, where these were exposed in experimenting on the glosso-pharyngeal, without causing pain. When we add to all this the smallness of the nerve, compared with the extent of the muscles moved by it, we are led to believe that the sensitive filaments contained in this nerve must be very few, if, under ordinary circumstances, there are any present at all. I may state, that, in one of the animals, in which the constrictors of the pharynx were more freely exposed than usual in operating on the living animal, vigorous contractions were observed in these muscles, when the nerve was pricked with the forceps. I need not state, that to insure accuracy in such experiments, care must be taken that they be made upon the pharyngeal branch of the *par vagum*, before it has received any communicating filament (if such be present) from the glosso-pharyngeal, and that the descending filaments of the glosso-pharyngeal, which cross this nerve, be excluded.

---

* Alison's Outlines of Physiology, p. 148.

---

* It is perhaps going too far to say, that it is the sole motor nerve of these parts; for Paletta, in describing the smaller portion of the fifth pair, states, that a twig from the external pterygoid branch passes to the *circumflexus palati* muscle. Ludwig. Scrip. Nov. Min. Se. Tom iii. p. 74. Mayo also mentions this twig (No. ii. Anat. and Physiol. Comment.)

Effects of section of the pharyngeal branch of the par vagum upon the function of deglutition.—If this nerve be, as we have supposed, the motor nerve of the muscles of the pharynx and isthmus of the fauces, the section of it ought to be followed by considerable derangement of this function. To test this opinion, the pharyngeal branch of the *par vagum* was cut across on both sides, and a portion of it removed, in five dogs. On three of these, satisfactory observations were made. In all the three, the function of deglutition was considerably impaired, and this was manifested exactly in the same manner. I shall only briefly detail one of these experiments.

Exp. XVII.—The *pharyngeal branch* of the *par vagum* was cut on both sides before it had given off any branches. The inflammation and swelling of the neck were allowed to subside before any observations were noted down. This animal, on swallowing a morsel of moderate size, could convey it readily into the posterior part of the mouth; but at this stage of the process of deglutition it began to make strong movements of the muscles of the neck; during each of these the head was carried down towards the thorax. After a greater or less number of these efforts, the animal again looked out for a fresh portion of food. When the morsel was very small, one or two of these movements were generally sufficient to pass it through the *pharynx*; if large, the movements became more violent, numerous, and prolonged.

It appears, then, that when these *pharyngeal* branches of the *par vagum* are divided, and the *pharyngeal* and *palatine muscles* paralysed, the food is forced through the pharynx to the commencement of the œsophagus, by the powerful contraction of the muscles of the tongue, and those attached to the larynx and hyoid bone, all of which are moved, except the *digastric* and *stylo-hyoid* muscles, by the *hypoglossal* and descending branches of the *cervical plexus* of nerves. When the morsel is small, the movements of these muscles seem to force it pretty readily (as can be easily imagined) through the bag of the *pharynx*, to the upper part of the *œsophagus*, when drawn forwards and dilated by the ascent of the *hyoid bone*. The difficulty must obviously increase as the size of the morsel increases; and the most violent efforts of the muscles which move the *hyoid* bone and *larynx* are necessary, if they succeed at all, in forcing a large mass through the *pharynx*.

While, then, the glosso-pharyngeal is one of the nerves upon which the sensations of the pharynx and fauces depend, the pharyngeal nerve of the *par vagum* is a motor nerve of the same parts. This view of the functions of these nerves is supported by their ultimate distribution upon the pharynx and fauces, as far as I have been able to trace it. From the free anastomoses of the filaments of the glosso-pharyngeal, pharyngeal branches of the *par vagum*, and the sympathetic, forming what is properly called the *pharyngeal plexus*, it is absolutely impossible to trace all, or even the greater part of these filaments to their ultimate distribution, unmixed with each other. But, from several minute dissections of these nerves on the human subject, and also upon the dog, where the ramifications of these nerves are fewer and larger, and do not appear to anastomose so frequently as in the human species, I have satisfied myself that those filaments of the pharyngeal branch of the *par vagum*, which do not anastomose with others from the glosso-pharyngeal, are entirely ramified in the muscular fibre; while on tracing the unmixed filaments of the glosso-pharyngeal, they generally, after a long and winding course through the muscular fibres, pass ultimately to the mucous membrane, so that comparatively very few of these are lost in the muscular fibres.

That a few of the filaments of the glosso-pharyngeal appear to be lost in the muscular fibre, is certainly no proof that this is partly a motor nerve; for as it has been shown by Sir C. Bell, and the fact is easily verified, the muscular fibres belonging to the animal functions (and the palatine and pharyngeal muscles are as it were on the debatable ground between the animal and organic functions,) are supplied with sensitive as well as with motor filaments, to endow them with the muscular sense. If these attempts to unravel the functions of the most important of the complicated nerves of the pharynx and fauces, and to ascertain their relative shares in the performance of the function of deglutition, be still imperfect, I may be excused on account of the intricacy of the subject, and particularly when it has been stated on the best authority, that, up to this period, "the precise office of each nerve in these parts has not been ascertained."[*]

Laryngeal Branches of Par Vagum.—Before proceeding to the consideration of the experiments upon the laryngeal branches of the *par vagum*, we shall advert for a little to their anatomical distribution upon the larynx, since this bears in a direct manner upon some of the most important questions connected with the functions of these nerves.

---

[*] Alison's Outlines of Physiology, p. 213.

After it had been demonstrated by the experiments of Legallois, that compression or section of the *inferior laryngeal nerves*, or of the trunks of the *pneumogastrics*, above the origin of these branches, arrested the movements of the muscles of the *glottis*, and were frequently followed by dyspnœa, and even by suffocation, particularly in young animals; and when it had also been ascertained by the observations of physicians, that derangement of the movements of these muscles is also not unfrequently the cause of alarming paroxysms of *dyspnœa*, more especially in children, occasionally terminating in death, it became an object of considerable practical importance to ascertain the relative share which these nerves have in regulating the movements by which the aperture of the *glottis* is diminished or enlarged. For without a correct knowledge of the manner in which these movements are produced in the healthy state, it is apparent, that we cannot with safety advance one step in the explanation of their deranged conditions.

There are obviously two methods of examining this question, viz. by tracing these nerves to their ultimate distribution, and by experiments on animals. If in following the first method, we find that one of these nerves is distributed upon certain muscles of the *larynx*, and not upon others, we must of course consider it as finally ascertained that this nerve has no effect, in regulating, as a motor nerve, the movements of those muscles, upon which it is not distributed. And, as is well known, the anatomical arrangement of these nerves is the strongest fact adduced by Magendie in favour of his opinion, that the *superior laryngeals* move the muscles which shut the superior aperture of the *glottis*, and the *inferior laryngeals* or *recurrents* those which open it. For according to Magendie,[*] Cloquet,[†] and many other anatomists and physiologists who have taken it on their authority, the *arytenoid muscles* receive their nervous filaments solely from the *superior laryngeals*. That filaments of the *superior laryngeal nerves* pass into the *arytenoid muscles* is allowed by all anatomists; but there can be as little doubt that they receive a filament from each of the *inferior laryngeals*. Among those who have described this *arytenoid* branch of the *inferior laryngeal or recurrent*, previous to the announcement of this statement by Magendie, we may mention Andersch,[‡] Bichat,[§] and J. F. Meckel.[‖] And, among those who have since that time examined these nerves, and ascertained the existence of this *arytenoid* branch, we may mention Rudolphi,[¶]

---

[*] Compendium of Physiology, 4th edit. p. 132. Milligan's Translation.

[†] Traité d'Anatomie Descriptive, Tome ii. p. 622.

[‡] Fragmentum Descr. Nerv. Card. &c. in Tom. ii. p. 139, Ludwig. Scrip. Nerv. Min. Sel.

[§] Traité D'Anatomie Descriptive, Tome iii. p. 216.

[‖] Manuel D'Anatomie Gen. Descrip., &c. Tome iii. p. 66.

[¶] Physiologie, Bd. ii. p. 374. These dissections were made by Schlemm.

Bischoff,[*] Swan,[†] and Cruveilhier.[‡] I have repeatedly satisfied myself of the existence of this *arytenoid* branch of the *inferior laryngeal*, and the dissection is one which can leave no kind of doubt on the matter. It is obvious that those who have failed in detecting this branch have been misled by the circumstance, that it appears to enter the *crico-arytenoideus posticus*, and to be destined for that muscle. On being traced upwards, however, it is found to continue its course inwards and upwards, between the anterior surface of the *crico-arytenoideus posticus*, and the posterior surface of the *cricoid cartilage*, to reach the lower margin of the *arytenoid muscles*. I shall shortly state the conclusions I have come to regarding the ultimate distribution of these nerves upon the *larynx* and upper part of the *trachea*, drawn from careful dissections in the human subject. The *recurrent* in its course upwards to the *larynx* sends various filaments to the muscular fibres which complete the tube of the trachea behind, and others which perforate the narrow intervals between the *cartilages* to reach the mucous membrane of the *trachea*. Having arrived at the *larynx*, it sends distinct branches to the *crico-arytenoideus posticus*, *crico-arytenoideus lateralis*, *thyro-arytenoideus* and *arytenoid muscles*, or, in other words, to all the muscles which move the arytenoid cartilages.[§] These branches evidently terminate in the muscular fibre. In fact, the only filaments of the *inferior laryngeal* which appear to proceed to the mucous surface of the *larynx*, are a few from the terminating or *thyro-arytenoid branch*. I have seen one or two very slender filaments pass to the *crico-thyroid*, from that branch of the *inferior laryngeal*, which, after sending ramifications to the mucous surface of the lower part of the *pharynx*, anastomoses with the *external laryngeal* branch of the *superior laryngeal*, but these filaments do not appear to be constant.

Superior Laryngeal Nerve.—The *external laryngeal* branch of the *superior laryngeal* nerve, gives a few filaments to the *inferior constrictor of the pharynx*, more to the *thyro-hyoid muscle*, and a comparatively large and distinct branch to the *crico-thyroid*, which evidently terminates in that muscle. The internal laryngeal branch of the same nerve is almost entirely distributed upon the mucous surface of the *epiglottis* and interior of the *larynx*. By far the greater part of the filaments of this branch of the nerve which ramify in the *arytenoid*, *thyro-arytenoid*, and *crico-aryte-*

---

[*] Comment. De Nervi Accessorii Willisii Anat. et Physiol. p. 27. 1832.

[†] A Demonstration of the Nerves of the Human Body. Plate xvi. fig. vii. This contains a very accurate representation of the course of this twig.

[‡] Anatomie Descriptive, Tome iv. p. 963. 1835. Dr Sharpey informs me that he has been accustomed to describe this branch in his lectures.

[§] I here consider the muscular fibres described as the *thyro-epiglottideus* as a part of the *thyro-arytenoideus*.

noideus lateralis muscles proceed to the mucous surface, and generally after a long and winding course among the muscular fibres. They thus present a striking contrast to the abrupt manner in which the filaments of the crico-thyroid twig of the external laryngeal terminate in the muscular fibre. In fact, the only filaments of this *internal branch* of the *superior laryngeal* which appear to terminate in the muscular fibre, are some of those which pass into the *arytenoid muscles.* Those filaments which seem to terminate in the arytenoid are part of a twig which anastomoses with the arytenoid branch of the inferior laryngeal in the substance of the arytenoid muscle. A knowledge of the distribution of these nerves is, however, of itself insufficient to clear up their functions in a satisfactory manner, for it must be obvious that, though by anatomical investigation, we may ascertain that certain nerves supply particular muscles, and in this manner frequently form a pretty accurate notion of their function, yet when nervous filaments come from more than one source, and from a complex nerve like the *par vagum*, it is only by experiments upon animals, or by the observation of disease, that we can hope to ascertain which are motor, and which are sensitive. Besides the free anastomoses between those nerves must render it doubtful from which of them some of the minute filaments come. *

In entering upon the physiological investigation of the functions of the *laryngeal nerves,* I first proceeded to examine what effect the irritation of these has upon the muscles of the *larynx* in a recently killed animal.

Exp. XVIII.—The *larynx* was exposed and the *glottis* brought into view in a dog, immediately after it had been killed by a dose of prussic acid. On applying the galvanic wires to each recurrent nerve alternately, violent movements of the muscles of the *larynx* followed, and the *arytenoid cartilages* were first seen to approach each other, and then to recede. At each movement the small cartilages at the summit of the *arytenoids* (cornicula laryngis) came into close contact. On galvanising the *superior laryngeal* nerves, or rather the *internal branches* of these, for they had been cut across a little above where they perforate the *thryo-hyoid ligament*, no movement was observed. On again applying the wires to the recurrents, or to the trunk of the *par vagum* above the origin of the *recurrent*, the same results were obtained as before. The movements which followed irritation of the trunk of the *par vagum* were not so strong as those from irritation of the *recurrent* itself. Dr Alison was present at this experiment.

Exp. XIX.—The *larynx* was exposed, as in the preceding experiment, in a dog bled to death from the femoral arteries, but without dividing the *superior laryngeal nerves*. On applying the galvanic wires to the *superior laryngeals* before they had given off the *external laryngeal* branch, strong convulsive movements of the *crico-thyroid* muscle followed, by which the *cricoid* cartilage was approximated to and drawn under the *thyroid* and the *larynx* shortened. All the muscles attached to the *arytenoid* cartilages remained perfectly quiescent, so that no change took place upon the superior aperture of the *glottis*. On applying the wires to the *recurrent* nerves alternately, the same vigorous movements of the *arytenoid* cartilages were observed as in the preceding experiment. It was remarked that when the galvanic wires were kept applied to one of these *recurrent* nerves for some short time, the *arytenoid* cartilages were so approximated as to shut completely the superior aperture of the glottis. On removing one of the wires the cartilages then separated.

---

* For some further remarks upon the anatomy of these laryngeal nerves, see Part III.

These experiments were repeated on five other animals with the same results. In two of these, the movements observed on irritating the nerves were much feebler than those described, but, though varying in degree, as might be expected, they never varied in kind. I may add, that these movements are also well marked when the nerves are pinched with the forceps, and after they have been detached from the trunk of the *par vagum*. In these experiments it was distinctly observed, that the only outward movements of the *arytenoid* cartilages, seen on irritating the *recurrents*, were merely occasioned by their return to their former position after they had been carried inwards. This outward movement, then, no doubt, entirely depended upon the elasticity of the parts.*

From these experiments it was concluded that all the muscles which move the *arytenoid* cartilages receive their motor filaments from the *inferior laryngeal* or *recurrent* nerves. And as the force of the muscles which shut the glottis preponderates over that of those which dilate it, so the arytenoid cartilages are carried inwards when all the filaments of one or both of these nerves are irritated. These experiments also show us, that one only of the intrinsic muscles of the larynx receives its motor filaments from the superior laryngeal, viz. *the crico-thyroid* muscle, and that, consequently, the only change which this nerve can produce on the *larynx*, as a motor nerve, is that of approximating the cricoid to the thyroid cartilage,—in other words, of shortening the larynx.

---

* In these experiments I never could perceive any contractions of the *thyro-hyoid* muscle and *inferior constrictor* of the pharynx, on irritating the superior laryngeal, even when the *crico-thyroid* was acting most vigorously. Neither could I ever observe any movements of the *crico-thyroid* on irritating the recurrent. The *thyro-hyoid* muscle receives its motor filaments from the *hypoglossal* and the *inferior constrictor* of the *pharynx* from the *pharyngeal branch* of the *par vagum*.

I find that Bischoff[*] had examined the effect of irritating these nerves in the recently killed animal. And though he failed to observe the contractions of the *crico-thyroid* muscle, and the consequent shortening of the *larynx*, produced by irritation of the *superior laryngeal* nerve, and in place of this describes some supposed palpitation of the mucous membrane of the *larynx*, yet the other results obtained by him were similar to those we have described in Exp. XIX.

We have now to see how far the views we have stated above, are supported by the subsequent experiments on living animals.

The *superior laryngeal* nerve was cut on both sides in two dogs and one rabbit, and the animals readily swallowed both solids and fluids without exciting the slightest cough or the least difficulty of breathing. The lungs were carefully examined after death, and none of the food taken could be detected in the air-passages. In several animals the superior laryngeals were first cut, and the inferior laryngeals immediately afterwards, and it was ascertained that the previous division of the *superior laryngeals* did not prevent the difficult breathing and symptoms of suffocation, which not unfrequently follow the division of the *inferior laryngeal* nerves, particularly in young animals. To procure still more positive assurance of the effect of section of the different *laryngeal* nerves upon the movements of the muscles attached to the *arytenoid* cartilages, the following experiments were performed.

Exp. XX. All the *four laryngeal* nerves were exposed in a full-grown cat. The larynx was then dissected out by cutting between the hyoid bone, and thyroid cartilage, and drawn forwards so as to expose the glottis without disturbing the nerves. When the glottis came into view, the *arytenoid* cartilages were observed to be drawn backwards and outwards during inspiration, and to approximate considerably during expiration. The extent of these movements of the muscles of the glottis was in proportion to the extent of the other respiratory movements. When the animal was quiet and breathing less forcibly, the movements were slight. While uttering a cry, the sides of the superior aperture of the glottis were closely approximated, and were thrown into vibratory motion. While struggling violently, the superior aperture of the glottis appeared completely closed. A small opening was made into the trachea, and a silver probe passed upwards. This appeared to excite little if any uneasiness, until it arrived at the larynx. As soon as it entered the larynx it was instantly followed by close approximation of the sides of the superior aperture of the glottis, violent cough, and evident uneasiness. The same effect was produced by introducing the probe from above. After satisfying myself of these facts, one of the *recurrent* nerves was first cut across, with the effect of evidently diminishing the movements of the *arytenoid* cartilage on the side cut. The other *recurrent* was then divided, and instantly all the movements of the muscles of the *glottis* ceased, and the *arytenoid* cartilages were never carried outwards beyond the position in which they are found after death. The *superior laryngeals* were then cut, without effecting the slightest enlargement or any other change upon the *glottis*. As the *arytenoid* cartilages, after section of the *inferior laryngeal* nerves were now mechanically carried inwards by the rushing of the air through the diminished aperture of the *glottis*, during each violent inspiration of the animal, by which the aperture was still further contracted, its edges were kept apart with the forceps, until an opening was made in the *trachea* to prevent the immediate suffocation of the animal.* The experiment being now completed, the animal was killed by a dose of prussic acid.

---

[*] Oper. cit. p. 27.

Exp. XXI. The *larynx* was brought into view in another full-grown cat, as in the preceding experiment, and the various movements of the muscles of the *glottis* again watched for a short time. The *superior laryngeal* nerves were then cut without diminishing in the least any of the movements of the *arytenoid* cartilages. The sides of the superior aperture of the *glottis* were approximated in crying, so as to form but a narrow fissure, and in struggling, the aperture became completely closed, as when the *superior laryngeal* nerves were uninjured.

Nothing could be more satisfactory than the results of these two last experiments, and they complete the accumulated facts which we have adduced, in fully disproving the statement of Magendie, to which we have already referred, viz. that the *inferior laryngeal* supplies those muscles only which enlarge the aperture of the *glottis*, while the *superior laryngeal* furnishes the motor filaments to those muscles which shut the *glottis*.† They also illustrate in a very satisfactory manner the cause of the *dyspnœa* in some cases where the *inferior laryngeal* nerves are cut, compressed, or irritated. To the consideration of this last point we shall afterwards return. The movements of the muscular fibres of the *trachea*, no doubt, depend upon the *recurrent*, but we had no opportunity of actually witnessing this. If it were thought necessary to adduce any additional evidence, that the muscles of the glottis can act involuntarily, like the other muscles of respiration, we might state that we have seen these movements going on in unison with those of the other respiratory muscles, in animals deprived of all volition by a fatal dose of prussic acid.

---

* It is important to remark, that section of the superior laryngeals did not arrest these inward movements of the arytenoid cartilages.

† Allowing even that the recurrent nerves gave no filaments to the arytenoid muscles, the proposition of Magendie, that the superior laryngeal nerve alone moves those muscles which shut the glottis, would not necessarily be correct. For it is universally admitted, that filaments of the recurrent nerve are distributed in the thyro-arytenoid muscle, and no attempt has been made to prove these filaments to be merely sensitive; on the other hand, we have seen, from the anatomical distribution of these nerves, that this muscle must receive its motor filaments from the recurrent. Now, an examination of the course of the fibres of this muscle will, we think, fully bear out the generally received notion of its action, viz. that it must assist in diminishing the aperture of the glottis. The authority of Hoffman, (Aeroteria, p. 91, as quoted by Haller,) and of Haller himself, (Element. Physiol. Tom. iii. p. 387, Laus. 1761,) may doubtless be adduced in support of the opinion, that it

We have now to examine *to what extent these nerves are connected* with sensation. And, first, with regard to the effect of irritating the trunks of these nerves. I have exposed the *superior laryngeal* nerves repeatedly in living animals, and in all, as I have already stated, decided indications of suffering presented themselves, except in two dogs which had previously endured protracted pain. In some of these dogs, distinct convulsive movements of the muscles of the throat and lower part of the face were observed, similar to, but less strongly marked than those accompanying irritation of the glosso-pharyngeal. Whether this movement depended upon the sudden excitation of pain, or of some specific sensation, similar to, though feebler than that which we suppose to attend irritation of the *glosso-pharyngeal* nerve, we cannot pretend to determine. In support, however, of this last supposition, we may urge the anatomical fact, that a considerable number of the filaments of this nerve are distributed upon the mucous surface of the *pharynx*. I was anxious to ascertain whether irritation of these nerves would produce closure of the glottis by a reflex action. As the experiment is one in which it is difficult to arrive at accurate conclusions, without inflicting much pain, I did not persevere in the attempt. I may state, however, that in Exp. XXI. we observed, that when each of the superior laryngeal nerves was cut, the glottis was suddenly closed; but whether this was occasioned by a struggle of the animal from the excitation of pain, or depended upon the muscles of the glottis being thrown

---

enlarges the glottis. We consider, however, this view of the action of the muscle untenable. In confirmation of the opinion, that the action of this muscle has a contrary effect, and assists in diminishing the glottis, we may quote the authority of Cowper, Albinus, Soemmerring (Corporis Hum. Fabrica, Tom. ii. p. 138, 1794;) Meckel (Oper. cit. Tom. iii. p. 497.) and Lauth (Mem. de l'Acad. Roy. de Medec. Tom. iv. p. 110. 1835.) Some authors, as Meckel, Lauth, and Cruveilhier (Oper. cit. Tom. ii. p. 669,) even maintain that the action of the crico-arytenoidei laterales muscles, is to diminish the aperture of the glottis. Bichat also asserts, (Anat. Descrip. Tom. ii. p. 407,) that "les crico-aryténõidiens postéricurs sont les seuls agens de la dilatation de la glotte." The action of these crico-arytenoidei laterales muscles is certainly difficult to determine, as it must depend in a great measure upon the position of the *arytenoid* cartilages at the time they are thrown into action, and the synchronous contraction of other muscles.

into contraction by a reflex action, I cannot venture to decide. Irritation of the recurrent nerves is attended by much feebler indications of suffering. That this nerve does, however, contain some sensitive filaments, is indicated not only by the circumstance, that when pinched or tied, the animal generally gives symptoms of feeling pain, but also from the fact, that it sends numerous filaments to the mucous surface of the *trachea*, a few to the mucous surface of the lower part of the pharynx, and even a few to the inner surface of the *larynx*.* With regard to the effects of section of these nerves upon the sensibility of the mucous surface of the larynx, we have obtained very satisfactory results. We might *a priori* determine from the anatomical distribution of these nerves, that the sensations referred to the larynx are almost entirely dependent upon the superior laryngeal nerves. In Exp. XX. we observed that irritation of the mucous surface of the *larynx* after section of the *inferior laryngeals*, was still followed by great uneasiness and efforts to cough, while the movements of all the muscles of the *glottis* were arrested. In Exp. XXI. on the other hand, no uneasiness, or efforts to cough were excited even by rubbing the probe against the inner surface of the larynx, after section of the superior laryngeals, while the sympathetic and voluntary movements of the muscles of the glottis went on as before. I have also had occasion, while performing other experiments, to verify the same facts in the manner followed by Magendie in one of his lectures at the Collége de France.† Through an opening made into the trachea, a probe was passed upwards to the larynx. This excited little or no uneasiness until it reached the larynx. As soon as it entered the larynx, it excited great uneasiness and violent paroxysms of coughing. Section of the recurrents had no effect in diminishing the severity of these paroxysms of coughing, while they were instantly arrested by cutting across the superior laryngeals. Whether this striking difference between the sensibility of the parts supplied by the two laryngeal nerves depends upon the number of these filaments, and the manner in which they are distributed, or upon some difference in their endowments, I cannot pretend to decide.

In Exp. XX. we observed that when the *superior laryngeals* were divided, the presence of the probe in the interior of the larynx was not only unattended by uneasiness and cough, but it also no longer occasioned any sudden closure of the superior aperture of the *glottis;* and in Exp. XXI. though each introduction of the probe occasioned great uneasiness and efforts to cough after section of the *recurrents*, still the muscles of the *glottis* were not thrown into spasmodic contractions, as when they were entire. From these experiments we perceive, that when either the *recurrents* or *superior laryngeals* are divided, so as to break the nervous circle which these form through their connection with the central organs of the nervous system, irritation of the mucous surface of the *larynx* no longer excites contraction of the surrounding muscles, though their contractility has not been impaired. This nervous circle we may suppose to begin at the mucous surface of the *larynx*, to pass upwards through the filaments of the *superior laryngeals* to the *medulla oblongata*, and back again to the muscles through the filaments of the *recurrent*. I have also repeatedly attempted, but in vain, to excite contractions of the muscles of the *glottis*, by irritating the mucous surface in an animal recently killed. From these facts, we think that we are justified in concluding, that when any irritation is applied to the inner surface of the *larynx* in the healthy state of the parts, this does not excite the contraction of the muscles attached to the *arytenoid* cartilages by acting directly upon them through the mucous membrane, but that this contraction takes place by a reflex action, in the performance of which the *superior laryngeal* is the *sensitive*, and the *inferior laryngeal* is the *motor nerve*. And when we remember that no appreciable interval of time intervenes, between the application of an irritant to the mucous surface of the glottis and the contraction of its closing muscles, and reflect upon the circuitous course through which the nervous influence must travel, before it reaches these muscles to stimulate them to contraction, we may form some faint idea of the astonishing rapidity with which changes are accomplished in the nervous system. We also ascertain from these experiments that in the small *recurrent* nerves two sets of motor filaments are included,—one set transmitting the nervous influence which stimulates the opening muscles of the *glottis* to act synchronously with the other muscles of inspiration, the other set transmitting the nervous influence which stimulates the closing muscles to act synchronously with the other muscles of expiration. And when we remember that these filaments arise near each other, and from the same medullary tract of the spinal chord, this would furnish us with an additional proof (if any more were necessary) of the futility of attempting to explain sympathetic or associated actions by mere nervous connections.

---

* We shall afterwards have occasion to examine the functions of the œsophageal filaments of the recurrent.

† Lancet, July 1, 1837.

From all these experiments, then, upon the laryngeal nerves, we are inclined to draw the following conclusions:

1. That the superior laryngeal furnishes one muscle only with *motor* filaments, viz. the *crico-thyroid*.

2. That the superior laryngeal furnishes all, or at least nearly all, the *sensitive* filaments of the *larynx*, and also some of those distributed upon the *mucous surface* of the pharynx.

3. That the inferior laryngeal or recurrent furnishes the *sensitive* filaments to the upper part of the trachea, a few to the *mucous surface* of the pharynx, and still fewer to the *mucous surface* of the larynx.

4. That when any irritation is applied to the mucous membrane of the larynx in the healthy state, this does not excite the contraction of the muscles which move the arytenoid cartilages by acting *directly* upon these through the mucous membrane, but that this contraction takes place by a *reflex action*, in the performance of which the superior laryngeal is the *sensitive*, and the inferior laryngeal is the *motor* nerve.*

Does Section of the Laryngeal Nerves prevent the ingress of the food into the Larynx during Deglutition.—All the *four laryngeal nerves* were divided in two dogs, and four rabbits. Both dogs and two of the rabbits swallowed solids and fluids readily, and without exciting cough or difficulty of breathing. The other two rabbits refused the milk, but they swallowed solids without inconvenience. All these animals were carefully examined after death, and not the slightest trace of the food could be detected in the air-passages. From these experiments it would appear that if the closing muscles of the glottis can, as Magendie has shown, prevent the entrance of food into the larynx after removal of the epiglottis, the epiglottis can, on the other hand, prevent the ingress of food into the larynx, when the movements of all the muscles which diminish the size of the glottis have been suspended by section of the laryngeal nerves.

Effects of Section of the Laryngeal Nerves upon the Voice.—In the experiments upon the two dogs mentioned above, and others which we might adduce, in which the superior laryngeal nerves were cut, I could detect no change upon the voice. I will not by any means maintain that no change was effected, for my perception of differences in sound is far from being good. Since the variations in the length of a tube alter the graveness and acuteness of the sounds which it emits, we would expect that section of the *superior laryngeal* should, by arresting the movements of the *crico-thyroid* muscles, produce some change in this respect. Magendie† mentions that an animal, after section of the *superior laryngeal* nerves, "loses almost all its acute sounds; it acquires besides a constant gravity, which it had not previously." This he attributes to the arrestment of the movements of the *arytenoid* muscles. But we have shown that section of these nerves has no such effect. Supposing Magendie quite correct[*] in the occurrence of this change of the voice, may it not be explained in this manner. He himself states,[†] that during acute sounds, the vocal tube is shortened, and lengthened during the formation of those which are grave. Now section of the superior laryngeals would necessarily have the effect of preventing the tube from being so much shortened as during the natural action of the parts; in other words, it might prevent the production of the acute sounds; and may not the relaxed state of the *crico-thyroid* muscles be one of the conditions necessary for the production of a grave sound?

---

* The functions of the œsophageal filaments of the *recurrent* will be examined along with the other *œsophageal* filaments of the *par vagum*.

† Oper. cit. p. 138.

With regard to the effects of section of the recurrent upon the voice,—a physiological experiment which has been performed so very frequently since the time of Galen, we have no observations to make. We may merely remark, that we found, as the second Monro[‡] has stated, that the voice is not altogether lost, for we ascertained that the animal, in some cases at least, could still emit a very faint howl.

It is not my object here to examine the various combined contractions of the muscles of the larynx, which these laryngeal nerves effect,—whether instinctively or sympathetically, as in natural or inarticulate language, and in the function of respiration; or voluntarily, as in artificial or articulate language. Of the great disturbance of these important functions, which either necessarily or occasionally arises from section of these nerves, we have had abundant proof. Perhaps the most interesting of all the associated movements of these muscles to the practical physician, are those connected with the respiratory function, as they promise to throw light upon some important forms of disease. Since these movements were first pointed out by Legallois,[§] they have been repeatedly observed in the lower animals by several experimenters; and by Mr Mayo[||] and Sir C. Bell,[¶] in individuals of the human species, after unsuccessful attempts at suicide. The energy and extent of these movements, when the respiration is much hurried by the struggles and pain of the animal, appear quite astonishing when witnessed for the first time. When the respiration, however, is such as is natural in a state of rest, the sides of the glottis remain quiescent, or at least nearly so.[**] The manner in which section or compression of the laryngeal nerves arrests these movements is well illustrated by Exp. XX.

---

[*] Bischoff (Oper. cit. p. 27.) says "duobus canibus *laryngeum superiorem* utrimque dissecui; sed neutrius canis vox nec post plures quidem dies mutata est."

[†] Oper. cit. p. 139.

[‡] Observations on the Nervous System, p. 68.

[§] Sur le Principe de la Vie, p. 197.

[||] Medical Gazette, Vol. xiv, p. 22.

[¶] Nervous System, p. 484, ed. 3. or Phil. Trans. 1832.

[**] Legallois and Mayo, oper. cit. It is probable that when the larynx is small, as in young animals, these movements are constant, even when the respiration is not hurried.

and XXI. From these we learn, that when the inferior laryngeal nerves are cut, all the movements of the muscles of the arytenoid cartilages are arrested, and the superior aperture of the glottis can no longer be dilated during inspiration. In fact, the sides of the *glottis* are not only no longer separated by an active force, but they are rendered quite passive, and yield readily, within certain limits, to the slightest external force applied to them. The *glottis* now presents the appearance which it does some time after death ; indeed it is probably still more diminished in size, for as the contractility of the muscular fibre is unimpaired by section of the nerves, their tonicity may still occasion further diminution, since the strength of the closing, preponderates over that of the opening muscles. When the *recurrent* nerves are cut in an adult animal, where the aperture of the *larynx* is large, a quantity of air may still find its way through the diminished aperture of the *glottis*, adequate in many cases to carry on the respiratory process in a sufficient manner, particularly if the muscles of inspiration are not acting violently. If, on the other hand, the capacity of the *larynx* is proportionally smaller, as in young animals, the air rushes through the diminished aperture in a narrower stream and with increased force, more especially when the inspiratory movements are violent,—or, in other words, when the capacity of the thorax is suddenly and greatly enlarged,—and the consequence is, that an insufficient quantity of air reaches the lungs. This quantity is still further reduced, by the circumstance, that the now passive sides of the superior aperture of the glottis are carried inwards by the current of air, as in Exp. XX. where it was remarked that, at each inspiration, the arytenoid cartilages were so closely approximated, as almost entirely to prevent the ingress of air, and where it was necessary to hold aside the edges of the superior aperture of the *glottis*, to prevent the immediate suffocation of the animal. It is the inspiration alone of the animal which is difficult, for the expiration is easy. The *arytenoid* cartilages are readily pushed aside by the expired air. The occurrence or non-occurrence of dyspnœa or suffocation after section of the *inferior layngeals* is to be explained by the greater or less capacity of the larynx in the individual animal, and the violence of its respiratory movements at the time. The crowing sound which frequently attends this condition of the laryngeal muscles is of course a mere physical effect, and depends upon the current of air rushing rapidly through the diminished aperture of the glottis, and may be imitated in the larynx of a dead animal. It is evident, then, that we must again return to Legallois's explanation of the cause of the *dyspœna* after section of the *recurrent* nerves, which I have been here illustrating and extending. For though this acute physiologist does not enter upon the consideration of the relative share which these nerves have in the movements of the *intrinsic muscles* of the larynx, yet he distinctly attributed the dyspnœa after the section of the recurrents to muscular paralysis.[*] He also explained the manner in which the arytenoid cartilages are carried inwards by the current of air passing through the *glottis*, from what takes place when a syringe is fixed to the trachea,—detached with the larynx,—from the body after death, and the air drawn forcibly downwards. At each stroke of the syringe, the edges of the superior aperture of the glottis are approximated, and if the current of air is strong, the aperture is completely shut.[†]

Whether the crowing disease of children, or *laryngismus stridulus*, depends upon the movements of the muscles of the glottis being suspended by compression of the *recurrents* or of the *pneumogastrics* themselves above the origin of these branches, by enlarged glands, as the late Dr Ley supposed, or whether, as is more generally imagined, it depends upon a *spasm* of these muscles, and "is obviously a part of a more general spasmodic affection,"[‡] it is not for me to determine. From the experiments we have detailed it is, however, apparent, that severe dyspnœa amounting to suffocation may arise both from irritation and compression of the inferior laryngeal nerves, or the trunks of the *pneumogastrics*. For when both or even one *recurrent* nerve was irritated, the *arytenoid* cartilages were approximated so as in some cases to shut completely the superior aperture of the *glottis*; and we have already explained at some length how paralysis of this nerve, occasioned by compression or any other cause, should produce this effect by arresting all the movements of the muscles of the *glottis*. We shall leave it to those who have had frequent opportunities of seeing this disease, to determine which of these two causes will best explain the phenomena which it presents. There appears, however, to be little doubt, that the crowing respiration and dyspnoea which accompany some cases of hysteria, depend upon a spasmodic closure of the *glottis*, produced by some irritation of the *recurrent* nerves.

---

[*] C'est donc bien réellement en paralysant les muscles aryténoïdiens et en relâchant par là les ligaments de la glotte, que la section des nerfs recurrens produit la suffocation." Whether Legallois by the term arytenoid muscles, here means the muscles universally known by this name, or whether he erroneously extends it to all the muscles attached to the. arytenoid cartilages, I have not been able to ascertain from his writings.

[†] In performing this experiment, care must be taken to produce a large and rapid current of air, such as we would suppose to pass through the larynx when the chest is rapidly and fully dilated in a violent inspiration. If the syringe employed is one of moderate size, a small larynx must be selected, otherwise the experiment will fail.

For an excellent exposition of the principal conditions of the system under which violent inspirations are apt to be made, or, in other words, when the aperture of the glottis is likely to be most diminished, see Dr Ley on Laryngismus Stridulus, p. 85.

[‡] Dr Marshall Hall's Lectures on the Nervous System, p. 76, 1836.

Œsophageal Branches of Par Vagum.—It is obvious that, as the *æsophageal* branches of the *par vagum* cannot be divided separately, we can only ascertain the functions of these by cutting the trunk of the *par vagum* itself in the neck.

Effects of the irritation of these nerves in an animal recently killed.—I have repeatedly seen violent muscular contractions induced along the whole length of the tube of the *æsophagus*, by mechanical or chemical irritation of the trunk of the *par vagum* in *dogs*, *rabbits*, and *cats*. At each application of the irritant, the *æsophagus* became shortened, and diminished in calibre. These movements extended also to the *cardiac* extremity of the stomach. In the stomach they were evidently more slow, prolonged, and vermicular, than in the *æsophagus*. They extended somewhat slowly from the cardiac orifice, over a greater or less extent of the left portion of the stomach. In one case they were more extensive and rapid than in the others, but still retained somewhat of their vermicular appearance. Muscular contractions of the œsophagus on irritating the *par vagum* in an animal recently killed, have been observed by Arnemann,[*] Cruikshank,[†] and Mayo.[‡] Mr Mayo could not perceive any muscular movements of the stomach upon irritating this nerve. These were, however, frequently observed by Tiedemann and L. Gmelin.[§] They have also been inferred by Brechet and Dr M. Edwards,[||] from the effects of galvanising the lower ends of the cut *pneumogastrics* in the neck on the living animal.

Effects of section of the æsophageal branches upon the movements of the oesophagus.

Exp. XXII.—A portion of the *par vagum* was removed on both sides, high in the neck, in a rabbit which had fasted sixteen hours. The portions removed included the *second* ganglion of the *par vagum*, and consequently the origin of the *superior laryngeals*. The respiration continued heaving, and somewhat difficult for a short time, but it soon became pretty easy. Some parsley was now thrown down on the opposite side of the room, which it immediately made for, and began to eat. It appeared to swallow the first mouthfuls readily, and without inconvenience. As it continued to eat, its breathing again became heaving, and it apparently felt very uneasy. It was soon after seized with attempts to vomit or cough,[¶] and retired from its food. After a short time the *dyspnœa* abated somewhat, and it returned to eat. It had only swallowed a small quantity, when the uneasiness, *dyspnœa*, and efforts to vomit, became as urgent as before. Every time it returned to eat (and it did this several times) these were always much increased in severity; so that it more than once appeared dying from suffocation. The breathing was now constantly very difficult, with a rattling sound in the *trachea.* Five hours after the section of the nerves, it again approached the parsley, but it had only eaten a very short time, when it sprung into the air, and after making violent struggles, and apparently suffering great uneasiness for nearly a minute, it died.—*Dissection.* This was done immediately after death. The nerves were found fairly divided. On exposing the trachea in the neck, I was struck with the great size of the œsophagus, which was distended like a sausage, and evidently compressed the trachea. The green colour of the parsley was quite distinctly seen through the coats of the œsophagus. The pharynx contained some parsley, but was by no means filled by it. The œsophagus in the thorax was distended, in the same manner as in the neck, down to the stomach. The stomach was well filled, but was certainly far from being unnaturally distended, and could have easily held more in its pyloric extremity. Considerable quantities of the masticated parsley were found in the larynx, trachea, and bronchi. In some parts of the lungs it was found in the minutest air-cells, and one or two portions were perfectly dense, from the quantity which they contained.

---

[*] As quoted by Soemmerring, oper cit. Tom. iv. p. 272.

[†] Medical Facts and Observations, Tom. vii. p. 153, or Phil. Trans. 1795.

[‡] Mayo, Anatomical and Physiological Commentaries, No. ii. p. 15.

[§] Recher. Exper. Physiol. et Chem. sur la Digestion, &c. p. 374.

[||] Archiv. Gen. de Med. Tom. vii.

[¶] It certainly presented much more the appearance of a cough than an effort to vomit. As, however, apparently similar muscular movements have been described by late experimenters, as an effort to vomit, and the possibility of the excitation of

Exp. XXIII.—The *pneumogastrics* were cut above the origin of the *superior laryngeals* in another full grown rabbit, after fasting twenty-four hours. This was followed by pretty severe dyspnœa and uneasiness. It refused for sometime to eat the parsley laid before it. When it began to eat, it was observed that it swallowed the first mouthfuls perfectly, and without any additional uneasiness. As it continued to eat, it became restless, and was affected similarly to the animal in the preceding experiment. The breathing after this continued very difficult, and it made but very few subsequent attempts to take food. It was seen alive ten hours after the section of the nerves. It was found dead next morning.—*Dissection.* The *œsophagus* was distended by the parsley, though not to the same extent as in the preceding experiment. The calibre of the *trachea* was also evidently somewhat diminished by the stuffed *œsophagus.* The stomach contained a moderate quantity of food, but was by no means fully

---

the sensation which induces coughing, under such circumstances, has been strongly denied, I will not at present venture an opinion on this question, until I have examined it more thoroughly. We shall call it in the meantime an effort to vomit. We could not expect a perfect cough in an experiment of this kind, after the movements of the muscles of the glottis had been arrested.

distended. A small quantity only of the masticated parsley was found in the air tubes.

We believe that in these two experiments, the first mouthful was carried into the upper portion of the *œsophagus* in the usual manner, but as the muscular movements of this tube had been suspended, it remained there. As additional mouthfuls arrived, they propelled forwards those which preceded them, so that after a while these formed a column of food reaching from the lower part of the pharynx to the stomach. As the difficulty of propelling it into the stomach increased, the œsophagus became more distended, and pressed upon the trachea, and thus produced the *dyspnœa*, and uneasiness. The difficulty of propelling the food still increasing, it accumulated in the *pharynx*, and passed into the open *larynx;* hence the severe paroxysms of *dyspnœa* and suffocation in Exp. XXII. Its passage into the *larynx* was, in the two experiments we have just related, much facilitated by the section of the *laryngeal* nerves. It is important to observe, that in these experiments, the stomach was found after death to contain only a moderate quantity of food, notwithstanding the great distension of the *œsophagus.*

This distension of the *œsophagus* after section of the *par vagum* in the neck has been remarked by several observers. Some of these have contented themselves with the simple statement of the fact; others have attributed it to paralysis of the *œsophagus;* while others again have referred it to other causes. Baglivi in one experiment found the œsophagus distended through its whole length, and though he does not state that he attributed this to paralysis of the œsophagus, yet it is probable, that this was his opinion; for after stating the circumstance, he adds, " nam cibus in ventriculum descendere non poterat." * Valsalva has also observed this retention of the food in the œsophagus, and it is likewise probable that he believed that it depended upon the same cause; for after mentioning that he dissected a dog which died on the tenth day after section of these nerves, and which had vomited frequently, he states, " quidquid autem cibi postremis diebus retinuerat, id omne intra œsophagum ab hujus initio ad sinistrum usque orificium ventriculi, nulla ejus facta mutatione, continebatur." † Dupuy distinctly refers this retention of the food in the œsophagus to its paralysis. ‡ In several experiments upon the effects of section of the *pneumogastrics* in horses, he ascertained that the œsophagus was distended, while the animals were still alive. That the œsophagus is really paralysed, it is easy, he says, to convince ourselves, " en mettant l'œsophage à

---

* Opera omnia, p 676, Anvers. 1715.

† Valsalvæ Operæ cum Epistolis Anatomicis, &c. J. B. Morgagni, Epist. Anatom. xiii. 37, Venet. 1740.

‡ Journal de Médecine Chirurgie, &c. Tom. xxxvii. p. 351.

découvert. Si on fait boire l'animal, on n'appercait aucun mouvement dans la membrane charnue de l'œsophage," &c. Sir A. Cooper [*] in his late experiments on the *par vagum*, after mentioning this retention of the food in the œsophagus, also refers it to paralysis of that tube. Several experimenters, however, explain this distension of the œsophagus differently. The late Mr Broughton maintained, that " the parsley found in the œsophagus must be the result of ineffectual efforts to throw it off the stomach." [†] Dr Wilson Philip also maintains the same opinion. [‡] Brachet seems to think that the œsophagus becomes filled in consequence of the animal having lost the sense of satiety, and continuing to eat after the stomach has been distended to the full. [§] In another place he seems to admit that the lower part of the œsophagus may be paralysed. [||] Some others seem to think that since the cardiac orifice of the stomach is paralysed, the food is readily forced from the stomach into the œsophagus. On reviewing Experiments XXII. and XXIII., and those which we have referred to above, it is at once apparent, that they are not sufficient, with the exception, perhaps, of those of Dupuy, fully to invalidate the explanation in which it is maintained, that the distension of the œsophagus depends upon the food being forced back from the stomach. Both of the animals we experimented on, made very frequent efforts to vomit after eating. It was, therefore, necessary to perform the experiment in another way.

Exp. XXIV.—The *pneumogastrics* were cut in the neck, as in the two preceding experiments, in two full-grown rabbits, which had been made to fast for twenty-six hours. Though the breathing of these animals was not difficult, it continued to be evidently somewhat heaving. About an hour after the section of the nerves, a quantity of parsley was offered to one of them, and it began immediately to eat. The first mouthfuls were swallowed without any change upon the breathing. Gradually, however, the breathing became more hurried and laboured as it continued to eat, and when the dyspnœa had become pretty urgent, it was instantly deprived of life by a blow upon the head, and before it had given the slightest indications of any effort to vomit.—*Dissection*. This was performed immediately after death. The *œsophagus* was found filled throughout its whole length with parsley, and it had evidently diminished the calibre of the *trachea*. The *stomach* contained but a very moderate quantity of food, and this when examined was found to consist principally of substances taken the previous day. In fact, a quantity of parsley, not exceeding a few leaves, was all that had reached the stomach, and was quite easily distinguished from the old food. This was lying between the outer surface of the old food and the inner surface of the *cardiac* extremity of the *stomach*. Not the slightest traces of the parsley could be found in any of the air-passages. On first exposing the distended *œsophagus*, it was observed that irritation of the *lower* end of the cut *pneumogastrics*, both by the forceps and galvanism, produced vigorous contractions of the muscular fibres of the *œsophagus*, which extended over the *cardiac* portion of the *stomach*. A similar experiment was performed on the second rabbit, about two hours after section of the nerves, with exactly the same results. The same movements were also observed in the œsophagus and stomach, on irritating the lower end of the cut nerves. Dr Alison witnessed the dissection of the first rabbit, and the experiment and dissection of the second.

---

[*] Guy's Hospital Reports, Sept. 1836.

[†] Quarterly Journal of Literature, Science, &c. Vol. x. p. 13.

[‡] Experimental Inquiry, &c. p. 112, ed. 3d.

[§] Système Nerveux Ganglionaire, &c. p. 180, 1830. [||] Oper. cit. p. 204.

We believe that these experiments prove quite satisfactorily, that the *œsophagus* is distended before the *stomach*, and also fully bear out the explanation of the phenomena arising from the retention of the food in this tube which we have given above. It must be remembered that when the *pneumogastrics* are cut in the neck, even as high as the origin of the *superior laryngeals*, that the pharynx, and a very small portion of the œsophagus next to it, still retain their healthy action, for, as we have already seen, these receive their motor filaments from the *pharyngeal* branches of this nerve. These parts then continue to act, and propel the food down the passive *œsophagus*, as they would force it into any inorganic tube. That food should also be sometimes found in the *œsophagus* after death in some of those animals which have not fed subsequent to the section of the nerves, is also exactly what we would expect. For it is evident, that if efforts at vomiting come on, the powerful contractions of the abdominal muscles will force the food into the paralysed *œsophagus*. It could also easily be shown that the powerful contractions of the abdominal muscles necessary for coughing would also force the food from the stomach into the *œsophagus*.

This arrestment of the movements of the muscular fibres of the *œsophagus* in deglutition after section of the *pneumogastrics*, when taken along with the fact observed in the two last experiments, proves, that this does not depend upon any diminution in the contractility of these muscular fibres, but upon a breach being made in the nervous circle, which, through the intervention of the *medulla oblongata*, connects the muscular with the mucous coat. We, therefore, conclude that the muscular contractions of the œsophagus are not called into action by the ingesta acting directly as an excitant upon the muscular fibres through the mucous membrane, but by a reflex action, part of the *œsophageal* filaments of the *par vagum* acting as motor, and others, in the manner of sensitive nerves.* We believe that this fact affords a more satisfactory solution than has yet been offered of a physiological problem which has lately excited a good deal of attention, viz. whether any of the sympathetic actions of Whytt, the ("excito-motory actions" of Dr M. Hall,) can take place without the intervention of a sensation. The food is propelled along the œsophagus without our consciousness and without our volition, and yet we have seen, that, before the presence of the ingesta in this tube can excite its muscular fibres to contract and propel their contents onwards, the same conditions of the nervous system are necessary, as for the production of those sympathetic or instinctive actions which are not excited by mental acts.† For, First, an impression must be made upon the nervous filaments of the *æsophageal* branches ramified in the mucous coat. Secondly, This impression must then be transmitted along these filaments to the central organs of the nervous system. Thirdly, Some other change must be transmitted backwards from the central organs of the nervous system (in this case the medulla oblongata) along the motor filaments to the muscular coat, by which the stimulation and consequent contraction of the muscular fibres are produced.‡ We have here, then, a natural sympathetic action in the human body occurring without the intervention of a sensation, and simply because the presence of such a sensation is not necessary for the proper performance of this function. From this and other facts which have been adduced in discussions on this question, I think we are fully entitled to argue that sensation is not a necessary condition for the production of those sympathetic actions with which it is so closely linked. Besides, it can be shown that these sensations have been connected with their attendant movements for an evident purpose; and if this purpose is one which is not necessarily instrumental in the production of the movements themselves as muscular movements, but to further the ends for which they were designed, we have already succeeded in obtaining a sufficient reason for the presence of these sensations, without being obliged to believe that they are actually concerned in the production of these movements. To illustrate my meaning by an example;—when the *bladder* and *rectum* are filled by their usual contents certain impressions are made upon the *spinal* sensitive nerves distributed in their mucous coat, and these, when conveyed to the central organs of the nervous system, excite certain sensations; upon this certain muscular movements follow, by which the contents of these organs are expelled. Now the presence of the sensations is no absolute proof that their excitation is necessary for the performance of these muscular movements, for it must be at once obvious, that they here serve most important purposes, independent of any supposed influence exerted in the actual production of the movements. For if these muscular movements by which the contents of the rectum and bladder are expelled, were always to occur when the impressions were made, very serious inconveniences would evidently be occasioned. It is necessary, then, for our own comfort and well being, that these movements should be influenced to a very considerable extent by volition; and of course this could only be accomplished by associating sensation with the excitation of the impression. When we take these circumstances along with the experiments we have stated, we may, I believe, safely conclude, that these sensations are not concerned in the production of these movements, as muscular movements, but have been superadded for an ulterior purpose. The same kind of reasoning could easily be applied to all the other instinctive and sympathetic actions found conjoined with sensation in the healthy condition of the body, but which do not require the intervention of the brain for their performance.*

---

* Or, to use the phraseology of Dr M. Hall, the contraction of the œsophagus in deglutition is an excito-motory action—the filaments of the œsophageal nerves distributed in the mucous coat being the excitors, and those in the muscular coats being the reflex or motors.

† Among the sympathetic or instinctive actions which require the intervention of a mental act, or the excitation of a sensation, we may enumerate laughter, weeping, &c. These require the agency of the brain for their performance.

‡ Mr W. B. Carpenter has given a very excellent tabular arrangement of the voluntary and instinctive actions, accompanied with some very perspicuous remarks. Number 132 of this Journal.

The results obtained from these experiments upon the œsophageal branches of the *par vagum*, are at direct variance with the Hallerian doctrine, that the muscular fibres of the œsophagus are called into contraction by a direct impression. Though this does not occur in the healthy condition, it is probable that both the muscular fibres of the œsophagus, and also the principal closing muscles of the glottis, may be called into action by a direct impression, when the mucous surfaces of these organs are inflamed. For we find in many cases of disease or injury of the spinal chord, that the bladder ceases to expel its contents. In some of these cases, as I have myself seen, the urine after a time no longer requires to be drawn off by the catheter, but is constantly expelled as soon as it has accumulated in small quantities. On dissection of such cases after death, the mucous coat is found thickened and inflamed, and the muscular coat is greatly increased in strength and contracted upon itself. We believe that the explanation of such cases is this, that as long as the mucous coat is in a healthy condition, the urine fails to excite the action of the muscular coat by a direct impression, but when the former becomes inflamed this is effected.

---

* These sympathetic or "excito-motory movements" were well known, and described by Whytt and Monro. That some of them do not require the agency of the brain for their performance was clearly proved by the experiments of Blane, Legallois, Flourens, and others. It was also stated previous to the appearance of the publications of Dr M. Hall, that these movements were independent of *sensation*. Sir G. Blane, for example, when relating the experiments referred to above, states, "that there are facts which show that instinctive actions, even in animals endowed with brain and nerves, do not depend on *sensation*. (Lectures on Muscular Motion, read at the Royal Society in 1788.) Dr M. Hall, availing himself of the late discoveries, by which it has been shown that the nervous filaments which transmit impressions to the central organs of the nervous system, are distinct from those which convey the motive influence back to the muscles, has extended and more fully illustrated this view of the independence of these sympathetic movements upon sensation, and has formed it into a kind of Corps de Doctrine.

The arrestment of the movements of the *æsophagus* in deglutition after section of the *par vagum* completely invalidates the evidence adduced by Brachet,* in favour of the dependence of the sense of satiety upon the integrity of the *par vagum*. We do not wish to deny that this may be the case; we only mean to affirm that the data upon which Brachet rests his conclusions are obviously insufficient.

Cardiac branches of Par Vagum.—It may be considered as perfectly ascertained by numerous observers, that section of the *par vagum* above the origin of the cardiac branch of this nerve does not materially affect the heart's action, and that the sudden death occasionally remarked after the division of these nerves, and which some of the early experimenters attributed to arrestment of the action of this organ, was in fact dependent upon the suffocation of the animal, by suspending the movements of the muscles of the glottis. We may then, I believe, fairly attribute the increased frequency of the pulsations of the heart, observed during and for some minutes after the experiment, to the struggles and terror of the animal, for in a short time the action of the heart is as slow and vigorous as before the section of the nerves. Though the contractility of the heart is independent of the brain and spinal marrow, yet we know, from the experiments of Legallois, Wilson Philip, and others, that injuries of these organs influence the contractility of the heart in a most important manner. A sudden injury extending to a considerable portion of the brain arrests or at least much enfeebles the heart's action, and the extent to which the contractions of this organ are affected by mental emotions is well known. It is generally believed that it is through the cardiac branches of the *par vagum* that this influence is transmitted from the brain to the heart; but I am not aware that there are any decisive facts in proof of this opinion.

Exp. XXV.—Two rabbits were killed by crushing the brain extensively and suddenly by blows with a hammer. In one of these a portion of each of the pneumogastrics above the origin of the superior laryngeals had been removed. On exposing the heart of the rabbit in which the nerves were left entire, which was done as expeditiously as possible, these contractions of the heart were extremely rapid and very feeble. On exposing the heart of the animal, in which the nerves had been previously cut, which was also done immediately after the brain had been crushed, the action of the heart was evidently much slower and more vigorous than in the other animal. This comparative experiment was again repeated with the same results. The action of the heart was also examined in other two rabbits, on which the pneumogastrics had also been previously divided in a similar manner before the brain was crushed, and in neither of these did it present the same rapid and feeble movements, which I have always seen when these nerves were entire.* Now since the contractility of the heart can also be effected by extensive and sudden injury of the spinal chord after the brain has been removed, it would appear that the influence of causes acting on the central organs of the nervous system may be transmitted to the heart by two channels, viz. by the *par vagum*, and by the *sympathetic system*. In these experiments, the trunk of the sympathetic in the neck was divided along with the *par vagum*, but this of course could not affect the greater number of the sympathetic nerves passing to the heart.

---

*Oper. cit. Exp. 50 and 53.

Pulmonary Branches of the Par Vagum.—The only method of experimenting on the pulmonary branches of the *par vagum* which we can adopt in the living animal, is that of cutting the trunk of the nerve itself, as it lies in the neck.

Effects of Section of one Pneumogastric Nerve upon the Lung of that side.—About two years ago I commenced, at the suggestion of Dr Alison, a series of experiments upon the effects of section of the *pneumogastric* nerves upon the *respiratory murmur*, as it might probably enable us to ascertain what is the cause of the first departure from the healthy condition of the lungs after section of these nerves. As I was led by the statements of Wilson Philip† to believe that section of one of the *pneumogastrics* would produce the usual morbid changes in the lungs which are observed after the section of both, and by the results of the experiments of Magendie‡ and Mr Swan,§ to expect that these would be confined to the side operated upon, I selected this method of experimenting, as the sound lung in that case would afford an accurate standard of comparison, by which to judge of the changes effected. No doubt the well-known experiment of Haighton* is inconsistent with the supposition, that section of one of the nerves destroys the function of the lung on the same side; but as he simply divided the nerve without removing a portion of it, the re-union of the cut ends might have occurred before a sufficient time had elapsed to permit these morbid changes to be effected. I have removed a portion of the *par vagum* in fourteen animals, and have never yet observed any morbid structural change which I could attribute to the section of the nerve. Two of these were calves, and were killed about twenty-four hours after the section of the nerve: seven of them were dogs, and were allowed to live from four to ten days: three rabbits were allowed to live a fortnight: one rabbit lived three months, and one rabbit was killed after six months. None of these animals appeared to suffer any bad consequences from the operation. The dogs breathed easily, and ate and digested as before; the rabbits also were as lively and active as ever, after the operation. No morbid changes, as I have said, could be observed in the lungs of the calves and dogs after death. The three rabbits which were allowed to live for a fortnight were apparently in perfect health when killed, and the lungs were shown to my friend Dr Knox, who was at the same time requested to examine if there was any structural difference between the lungs of the opposite sides, but he could perceive none. The rabbit which lived three months died of recent pneumonia, affecting *both* lungs equally. The lungs of the rabbit killed at the end of six months were perfectly healthy. In all these experiments, a sufficiently large portion of the nerves was removed to prevent their re-union. The morbid changes on the lung in the side on which the nerve had been cut, observed by Magendie and Swan, must have been accidental. The experiments which I have mentioned are sufficiently numerous to entitle us to conclude, that lesion of one of the pneumogastrics does not necessarily, or even generally induce disease of the lung of that side. This does not appear so remarkable, when we remember the free anastomoses between the pulmonary plexuses of the two sides.

---

* Dr Alison was present at one of these experiments, and made the same remark.

† Oper. cit. p. 145.

‡ Oper. cit. 401.

§ Essay on the connection of the Heart and Arteries, and the Functions of the Nervous System, &c.

Effects of Section of the Par Vagum upon the respiratory muscular movements.—As the pulmonary branches of the pneumogastrics are the only nervous filaments which the lungs receive from the cerebro-spinal axis, we would expect, in accordance with the generally received notions on the physiology of the nervous system, that all the impressions made on the mucous surface of the lungs which excite the sensations and sympathetic movements connected with the respiratory functions, are conveyed to the cerebro-spinal axis through this nerve. And this opinion is strengthen-ed by the experiments of Legallois and Flourens, by which it was shown, that though all the other parts of the encephalon above that portion of the *medulla oblongata* to which the *par vagum* is attached, could be removed without arresting the respiratory muscular movements, yet these instantly ceased, when this part of the nervous system was injured. And it is further well known, that if the spinal marrow is cut across, all the respiratory muscles are paralysed which receive their nerves from that portion of the spinal chord below the point divided, while those which receive their nerves from that portion of the spinal chord which remains in connection with the *medulla oblongata*, continue to perform their usual functions. From these and other facts, it may be considered as ascertained, that all the impressions made at the lungs must be conveyed to the *medulla oblongata*, before they can excite sensations or sympathetic movements. That the *par vagum* can convey these impressions from the lungs, is not only rendered probable by the connection of the *par vagum* with the *medulla oblongata*, but may be considered as proved by the results of the experiments upon section of the spinal chord, to which we have just referred. It, however, by no means necessarily follows, that this is the sole channel by which these impressions are conveyed to the *medulla oblongata*, for it is possible that these might reach the spinal chord through the branches of the sympathetic distributed upon the lungs, and in this way be conveyed upwards to the *medulla oblonguta*. This last supposition is certainly not a very probable one, and can only be admitted after satisfactory evidence in its favour.

---

* Medical Facts and Observations, Vol. vii. p. 163. Experiment IV.

We shall now examine how the facts accord with the theories on this question. That the respiratory movements continue after section of both pneumogastrics is now universally admitted, but physiologists are by no means agreed in what manner these proceed. Those who believe that the movements of the respiratory muscles are usually carried on by the exercise of volition, will of course maintain, that these proceed exactly in the same manner as before the section of the nerves. This being, however, an untenable supposition, we shall not discuss it further. Those, on the other hand, who maintain that this function, though capable of being influenced and controlled to a very considerable extent by volition, is nevertheless generally performed without our volition, and in consequence of impressions made at the lungs and conveyed to the *medulla oblongata*, must of course believe that this function is carried on differently after section of these nerves, from what it is in the natural condition of the body. Brachet asserts that an animal continues to breathe after section of the pneumogastrics, because it has acquired the habit of using the respiratory muscles.*

---

* Oper. cit. p. 132 " à l'habitude que le système nerveux cerébro-spinal a contractée de faire mouvoir les muscles respirateurs." How an animal could contract the habit of performing an *involuntary* action, it would certainly be difficult to explain.

Dr Marshall Hall believes that when these nerves are divided, the function of respiration is no longer an involuntary and a sympathetic movement, or, as he expresses it, *excito-motory*, but is now a cerebral function, or, in other words, is performed by an act of volition.* That these movements continue after section of the *pneumogastrics*, and under circumstances where it is impossible that they can be carried on by an act of volition, I have been reluctantly compelled to believe. For I am satisfied that these respiratory movements will not only go on regularly and vigorously for hours together in kittens one and two days old, but that they will also proceed in animals deprived of all volition by a small dose of prussic acid.† Thinking that it might be possible, though certainly not probable, that the impressions made at the lungs might in these cases reach the *medulla oblongata* through the free anastomoses between the laryngeal nerves at the larynx (for in the first experiments I cut the nerves, as is generally done, in the middle of the neck,) I proceeded to repeat the experiments by dividing the nerves near the base of the cranium, and above the origin of the superior laryngeals. The results, however, were the same as when the nerves were cut in the usual manner.

We are next naturally led to inquire, how the *sensation arising from the want of fresh air in the lungs*, or the *besoin de respirer*, is affected by section of these nerves? Brachet‡ has related some experiments, which appear to prove in a very conclusive manner, that this *besoin de respirer* is annihilated by section of the pneumogastrics. Though I considered the details given by Brachet as not satisfactory on some points, yet, after reading them, I had no doubt of the accuracy of his opinion. I am now, however, perfectly satisfied, from numerous experiments, that an animal will continue to evince great uneasiness after section of these nerves, when the access of air to the lungs is prevented. I have repeated these experiments in several ways, and with the same results. One of the methods followed was this.

Exp. XXVI.—The *par vagum* was cut on both sides in two kittens ten days old. When one of these nerves was cut, the blood in the carotids became dark-coloured, but it soon after resumed its natural appearance. When both nerves were cut, the blood in the carotids again became dark, the animal began to struggle, and it was necessary to open the trachea to prevent their immediate suffocation. After the trachea was freely opened, the blood in the carotids again assumed its arterial colour. Both animals struggled, made violent inspirations, and appeared to suffer great uneasiness when the access of air to the lungs was prevented. On compressing, for example, the exposed trachea with the forceps, the animals lay quiet for a few moments, making several inspiratory efforts gradually increasing in force and extent; after a few moments more, the inspirations became heaving, and they began to struggle and appear very uneasy.

---

* Philos. Mag. Jan. 1835, and Lectures on the Nervous System, p. 25.

† In one dog in which these nerves were divided, the respiration continued above twenty minutes after we had satisfactory evidence that the sensorial functions were arrested.

‡ Oper. cit. p. 133-4-5.

This experiment was repeated with similar results upon a kitten two days old. The nerves in this last experiment were cut above the origin of the superior laryngeals. I have also performed a similar experiment upon several rabbits and dogs. In all of these animals the breathing became very laboured, and the animal evinced every indication of great uneasiness, when the access of air to the lungs was *suddenly* and *fully* prevented.

From these experiments I conclude that section of the *par vagum* on both sides, neither arrests the transmission of those impressions made upon the mucous surface of the lungs, by which the respiratory movements are excited; nor does it annihilate the sense of anxiety arising from the want of fresh air in the lungs. We are obliged, then, to suppose, that these impressions are conveyed backwards by the sympathetic branches distributed upon the lungs to the spinal chord, and thus pass upwards to the *medulla oblongata*. As has been already stated, we believe that these impressions may also be transmitted through the *par vagum*. It is quite possible that the latter is the usual channel by which these are transmitted, and it is only when they become more intense that they pass along the other course we have mentioned. This may, perhaps, explain the slow respiration occasionally observed after section of the pneumogastrics. It is certainly contrary to the usually received physiological doctrines to suppose that the sympathetic system can, in the *healthy* state of the nerve, and of the parts upon which it is distributed, transmit those impressions by which the natural sensations and sympathetic movements are excited, but I cannot see how the facts can otherwise be explained. The peculiar pain felt on bruising the healthy testicle, and which we are led to believe depends upon the sympathetic, may also induce us to believe that a previously inflamed condition of the filaments of this nerve is not absolutely necessary to enable it to transmit those impressions which excite sensation.

Brachet[*] has also detailed several experiments which seem satisfactorily to prove that all the sensations occasioned by the presence of foreign bodies, &c. in the air-passages are dependent upon the integrity of the pneumogastrics. I have repeated these experiments on several dogs and cats, but have not yet been able to arrive at any conclusive results. The chief difficulty which I have experienced in making any satisfactory experiments on this question has arisen from the great insensibility of the mucous mem-

---

[*] Oper. cit. p. 157–8–9.

brane of the lungs in the healthy state. I have never yet been able to induce the severe paroxysms of coughing described by Brachet, by any mode of irritating the inner surface of the trachea and bronchi which I have adopted, if care were taken to prevent the application of these irritants to the inner surface of the larynx, when the superior laryngeals were entire. I injected by a syringe two drachms of alcohol slightly diluted, down the trachea of one dog, and as much *eau de cologne* into that of another, when both nerves were entire, without exciting any decided cough. The friction of a probe against the inner surface of the trachea and bronchi never produced cough. Though I have seen some reason to doubt that these sensations of the mucous surface of the lungs are affected to the extent stated by Brachet, yet I do not at present wish to offer an opinion upon this subject, until I have investigated it more thoroughly. I would only suggest at present, that it is possible that Brachet in some of his experiments may have overlooked a source of fallacy which would very seriously interfere with the results,—and that is, the facility with which some of the irritants used might reach the interior of the larynx; for it is to be remembered, that the nerves were cut below the origin of the superior laryngeals. If the head be depressed when a quantity of fluid is thrown into the trachea, or if the fumes from a muriatic acid bottle are used as an irritant, (as by Brachet in some of his experiments,) the chances are, that a part of these will reach the interior of the larynx, and excite violent efforts to cough. Perhaps this may explain in some measure the discrepancy between the results obtained by Brachet upon the sensibility of the mucous membrane of the trachea, and those obtained by practical surgeons in operations on the human species, and in some experiments by Haller[*] upon animals. Some of the animals I experimented on did cough slightly when fluids were injected into the trachea before the nerves were cut,—at least in the imperfect manner in which an animal must do when the trachea is opened.

Morbid changes in the Lungs after section of the Pneumogastrics.—Section of the pneumogastrics invariably proves fatal if the cut ends of the nerves are kept apart. The animal seldom if ever lives beyond three days, and generally dies sooner; but when the cut ends of the nerves are allowed to remain in contact, it sometimes lives ten or twelve days. There can be now no doubt that the section of these nerves proves fatal by its effects upon the lungs. The congested state of the blood-vessels of the lungs, and the effusion of frothy serum into the air-cells and bronchial tubes, may be considered as the characteristic and only constant appearance after death from section of the pneumogastrics. I am of course here supposing that the air is allowed to pass freely into the lungs. It is quite evident that section of these nerves does not prove fatal by removing any innervation necessary for effecting the changes by which the venous blood is converted into arterial, as Dupuytren supposed; nor by coagulating the blood of the pulmonary arteries, as Mayer maintains. The first point to ascertain in an investigation of this kind, is the first departure from the healthy condition of the organ,—to decide whether the effusion of the frothy reddish serum, by interfering with the usual changes of the blood in the lungs, causes the congested state of the pulmonary blood-vessels, and the severe dyspnœa, as is usually imagined; or whether this effusion is the effect of a previously congested state of the pulmonary blood-vessels and its attendant *dyspnœa*. If it be made out that the fatal dyspnœa is not the effect of the effusion of serum, we have next to inquire what is the probable cause of this congested state of the pulmonary blood-vessels and the accompanying dyspnœa. I have been collecting for some time past a considerable number of facts on these questions, but have not yet been able to obtain what I consider satisfactory data. Upon the discussion of this subject I shall not at present enter, but reserve it for another opportunity. If I hazard a few remarks upon this question, I wish that they may be looked upon as conclusions in which I myself do not place any very great confidence, until I have been more thoroughly satisfied of their accuracy. I am at present inclined to believe, from the experiments which I have made, that this frothy serous effusion is the *result* of the congested state of the pulmonary blood-vessels attending the severe dyspnœa which precedes death, and not the *cause* of this *dyspnœa*. The grounds on which I have adopted this opinion are these, 1*st*, This frothy serous effusion is exactly similar to the fluid in the air-passages in death from whatever cause, when preceded by protracted and severe dyspnœa. 2*dly*, The extent of this effusion appears to be proportionate to the duration and severity of the dyspnœa preceding death. 3*dly*, Dyspnœa is sometimes present after section of these nerves when the passage of air into the lungs is quite free, and before any serous fluid has been effused. What is the cause of the dyspnœa and congestion of the pulmonary vessels, I have not yet been able to satisfy myself, but I believe it probably depends upon paralysis of the muscular fibres of the bronchi. If these muscular fibres move in unison with the muscles of respiration, like those of the *larynx* supplied by the same nerve, they must exert a very important influence over the renewal of the air in the lungs. That we are not conscious of any such movements cannot be urged as an objection to this view, after what we have seen in the *œsophagus*. Of the existence of the muscular fibres of the

---

[*] Opera Minora, Tom. i. p. 402, Laus. 1762; or Sur la Nature Sensible et Irritable, Tom. i. p. 394, Laus. 1756.

bronchi described by Reisseissen there can be no doubt. I have seen these muscular fibres very distinctly in some of the smaller bronchial tubes. I have observed a circumstance in experiments upon dogs, which, if confirmed by more extended investigation, may throw some light upon this question. In four dogs in which the *par vagum* was cut on one side, the respiration of the same side, though quite natural immediately after the operation, became distinctly bronchial after a few hours. This continued for two or three days, and the natural respiratory murmur gradually returned. One of these dogs was killed during the continuance of this bronchial respiration, and no structural change could be detected in the lung. As I have, however, some reason to doubt from late experiments whether this is a constant occurrence, I shall defer its consideration until I have made more extended observations. I am inclined to believe from what I have seen, that pneumonia is a pretty frequent occurrence after section of these nerves.

Gastric branches of the Par Vagum.—As my experiments on these branches are not yet completed, I shall reserve this part of the investigation for a future opportunity.

PART III.—*Spinal Accessory Nerve.*

Before stating the experiments which I have made upon this nerve, I wish to advert for a little to its origin and distribution, and in this I shall restrict myself to those points which are most intimately connected with the discussions upon its functions. The origin of the spinal accessory from the spinal chord is sometimes higher and sometimes lower, but we have the authority of Huber,[*] Lobstein,[†] and Bellingeri,[‡] who have attended particularly to this subject, in stating that it most frequently commences opposite the *sixth* or *seventh cervical nerves.* This nerve, in its course upwards to the *foramen magnum*, is placed between the posterior roots of the spinal nerves and the *ligamentum denticulatum*, and receives its filaments, as Bellingeri[§] has clearly demonstrated, from the lateral or middle column of the spinal chord. The filaments of the *spinal accessory* may come entirely from the *middle column* of the *spinal chord*, or it may also receive some filaments from the posterior roots of the first and second *cervical nerves.* These filaments, from the posterior roots to the

---

[*] Huber says at p. 13, "De Medulla Spinali et Speciatim de Nervis ab ea Provenientibus," that it commences opposite the seventh cervical, but he afterwards places it opposite the sixth.

[†] Lobstein (De Nervo Spinali ad Par Vagum Accessorio, p. 341, Tom. i. Thesaus. Diss. Sandifort, 1768,) says it commences under the sixth pair of cervical nerves by a slender beginning.

[‡] Bellingeri (De Medulla Spinali, Nervisque ex ea Prodeuntibus, p. 74, 1823,) adopts the description of Huber where he states that it commences opposite the seventh.

[§] Oper. cit. p. 51 and 55. See also Edin. Med. and Surgical Journal, Vol. xliv. p. 396.

spinal accessory, when present, rarely come from the second, but generally from the first cervical. When they come from the posterior root of the second cervical, they are few in number. Those from the first cervical vary considerably in number; for we find sometimes a few, sometimes the greater part, at other times the whole of the filaments of this root passing to join the *spinal accessory*. This junction between these two nerves may be confined to one side of the spinal chord, or it may be present on both. This communication between the *posterior root* of the first cervical and the *spinal accessory* is far from being rare, and Lobstein asserts that it is more frequently present than absent.* When the posterior root of the first cervical joins itself to the *spinal accessory*, a branch of equal size leaves the trunk of the *accessory*, either at the point where it is joined by the posterior root, as figured and described by Asch, † or from three to six lines above this junction, as figured by Huber,‡ and described by Bellingeri. § This branch, after leaving the accessory, proceeds outwards, approaches the anterior root of the first cervical, and takes the place of the posterior root. When the posterior root of the first cervical comes from the *accessory*, it generally swells into a ganglion in the usual position. Sometimes, however, though rarely, a ganglion is found where the posterior root leaves the *accessory* to join itself to the anterior root. This ganglion was first pointed out by Huber, and its existence has been denied by Lobstein, Asch, Haller, and Scarpa, and has again been described by Bellingeri. I have seen this ganglion once, and it was present on one side only. It becomes an interesting question, to know whether or not the whole of the filaments joining the *accessory* from the posterior roots of the *spinal nerves*, leave it again to form the posterior root of the *first cervical*. Bellingeri answers this question in the affirmative.—" The filaments coming from the posterior roots to the accessory are not intermixed, but only approximated, so that they can be separated by slight traction."|| And in another place he says, " I believe that the filaments from the posterior roots which join the accessory, leave it again to proceed to the posterior root of the first cervical."¶ From this he concludes that this nerve contains no sensitive filaments. Müller ** adduces some unusual appearances in this nerve, observed by Hyrtl, Remak, and himself, which would seem to favour the opinion, that it contains some sensitive filaments, independent of those which it occasionally receives from the posterior roots. "I do not, however, affirm," he says, "that the spinal accessory always contains a sensorial element, but leave it doubtful."—"But in the case," he continues, "where the *nervus accessorius* forms an intimate connection with the posterior root of the first cervical or any other nerve, we may suppose an interchange, and this in the same degree will render probable the idea of Monro, that the communication of the spinal accessory with the posterior root of the first or any other spinal nerve will be an equivalent to it for a posterior root."[*] The only other point connected with the anatomy of this nerve to which we shall here refer, is its connection with the *par vagum*, for we shall have occasion to allude to it repeatedly, when examining the functions of this nerve. As the spinal accessory is passing through the *foramen lacerum* it divides into two branches,—an internal and an external. The internal, after giving off some filaments to assist in forming the pharyngeal branch of the *par vagum*, becomes incorporated with the filaments of the trunk of the *nervus vagus*. The *nervus vagus* swells into a ganglion (*ganglion secundum nervi vagi*,) where it is joined by the internal branch of the accessory, and by branches from the sympathetic. This ganglion is very distinct in the lower animals. Bischoff[†] states that he ascertained by dissections of the Mammalia that only a part of the fibres pass into the ganglion, and that the others retain their fibrous character. He also adds, that it is evident that those which form the ganglion belong to the *par vagum*, while those which do not enter into its formation belong to the internal branch of the accessory. From this gangliform swelling the superior laryngeal nerve arises.[‡] The *external branch* proceeds outwards, perforates the upper part of the *sterno-cleido-mastoideus*, sends filaments to this muscle; and to the *trapezius*, and forms at the same time several anastomoses with branches from the *cervical plexus*. The peculiar origin and course of this nerve, and particularly its intimate connection with the *par vagum*, have formed the basis of most of the speculations on its functions since the time of Willis. It was maintained by Willis,[*] that this nerve, from its connection with the *par vagum*, regulated those involuntary movements of the neck and arm connected with the emotions and passions. Lobstein also believed that the spinal accessory joins itself to the *nervus vagus* for the purpose of connecting it with the involuntary functions,[†] and he supposed that paralysis of this nerve might also affect the movements of the *pharynx* and *larynx*.[‡] Others have maintained that it is a nerve of involuntary motion, from the particular portion of the spinal chord from which it arises. It is, as is well known, one of Sir C. Bell's respiratory nerves, arising, as he supposes, from a particular tract in the spinal chord. According, then, to Sir C. Bell, it is a nerve of involuntary motion. Bellingeri believes that the lateral tract of the spinal chord from which the accessory arises, presides over the instinctive and sympathetic movements, and consequently this nerve must be one of involuntary motion.[§] Arnold,[||] Scarpa,[¶] and Bischoff,[**] maintain that the accessory stands in the same relation to the *nervus vagus* which the anterior roots of the spinal nerves do to the posterior.[††] These nerves, as they lie in the *foramen lacerum*, do certainly resemble very closely in appearance, the anterior and posterior roots of the spinal nerves. The junction of the internal branch of the accessory with the *par vagum* beyond the part where it swells into its superior ganglion increases the resemblance still farther. To this opinion we shall have again to refer. With these preliminary remarks I shall now proceed to give the results obtained from my experiments on this nerve.

---

* In speaking of the filaments which form this communication he says, " communicationem illud notamus quod sæpius accessorium subire quam eundem intactum relinquere observentur."

† De Primo Pare Nervorum Medullæ Spinalis, Tab. x. fig. ii. et Explicatio, p. 335. Ludwig, Sc. Nerv, Min. Sel. Tom. i.

‡ Oper. cit § Ibid. p. 80. || Ibid. p. 81. ¶ Ibid. p. 79.

** Arch. für Anat. und Physiol. No. ii. 1837.

---

[*] Oper. cit, p. 279.

[†] Ibid. p. 22.

[‡] Since the above remarks were written out, I have seen it announced in a paper by Mr E. Cock, in Guy's Hospital Reports for October 1837, that Sir Astley Cooper has discovered a new ganglion in the rabbit, which he terms the superior laryngeal ganglion. This, however, is obviously the *second ganglion* of the par vagum of some anatomists. It appears that Sir A. supposed, before he discovered this ganglion, that the superior laryngeal nerve furnished an objection to the opinion of Sir C. Bell, that all nerves of common sensation are provided with ganglia. But Sir A. seems to have forgotten that there is a true ganglion of the par vagum as it lies in the foramen lacerum. This superior ganglion of the vagus was known to Ehrenritter, figured by Wutzer, (De Corporis Humani Gangliorum, Fab. et Usu, Fig vii. 1818,) redescribed by Arnold, (Der Kopftheil des vegetativen Nerven-Systemes, p. 105, Heid. 1831); also particularly described by Bischoff, (Nervi Accessorii Willisii, Anat. et Physiol. p. 21, 1832); and now admitted by every anatomist who has examined it. The second ganglion of the par vagum, which Mr Cock thinks an entirely new discovery on the part of Sir Astley, has also long been known. It has been described by Vieussens, Willis, Scarpa, and others. It is figured by Wutzer (Oper. cit,) as the second ganglion of the par vagum. Bischoff, after stating that Arnold names this swelling upon the par vagum a gangliform plexus, thus expresses himself: "Verum apud mammalia dubito an argui possit hunc tumorem non reapse ganglion esse. In universum proportione in his bestiis multo crassius est quam

Effects of Irritating this Nerve in the Living and recently killed Animal.—These experiments on the living animal were performed on the external branch of the *accessory* before it per-

---

in humano corpore et simillimum sæpe est ganglio cervicale supremo Sympathetici quod situm est aut supra aut juxta aut infra illud vagi ganglion." (Oper. cit, p. 22.) In Tab. ii. he gives some very excellent engravings, in which the position and form of this second ganglion of the par vagum, and the origin of the superior laryngeal from it are represented in the cat, fox, sow, mole and weasel.

[*] Cerebri Anatome, &c. Cap. xxviii.

[†] Oper. cit. 346.

[‡] Oper. cit. 345.

[§] Oper. cit. p. 89–90.

[||] Der Kopftheil des vegetativen Nerven-Syst. Heidel. 1831.

[¶] De Gangliis Nerv. deque Essentia Nervi Intercost. Ann. Univers. de Medicine, 1831.

[**] Oper cit.

[††] It appears that this idea had been previously stated by Görres, (Exposition der Physiologie. Coblentz, 1805.

forates the upper part of the *sterno-mastoid*, as it is impossible to operate on the trunk of the nerve unless it is exposed within the cranium. Irritation of this nerve by the forceps in the living animal produces vigorous convulsive movements of the *sterno-mastoid* and *trapezius*, as was remarked by Dr M. Hall and Mr Broughton in their experiments.[*] This mode of irritating the nerve is not attended by any indications of suffering, unless the nerve is strongly compressed between the blades of the forceps. When the nerve is firmly included in a ligature, the animal gives very decided evidence of suffering pain. When the nerve has been firmly tied or cut across, irritation of the lower end is attended by the same convulsive movements of the muscles, while irritation of the upper end, or that in connection with the *spinal chord*, is unattended by any muscular movements. The same muscular movements are observed on irritating the nerve in the recently killed as in the living animal. From these experiments we conclude that the filaments of the *external* branch of the *spinal accessory* are principally motor, and that the sensitive filaments must be very few in number. Whether those sensitive filaments belong originally to the nerve, or whether it derives them from the other nerves at the base of the cranium, with which it anastomoses, we cannot at present determine.

Effects of the Division of these Nerves.—According to Sir C. Bell, the section of the *spinal accessory* paralyses the muscles to which it is distributed, as muscles of respiration, though they still retain their voluntary movements through the media of the spinal nerves. This appears to be established by the following experiment performed by Mr Shaw. "The *par vagum* of an ass was first divided, with the intention of causing difficult and laboured respiration. When all the respiratory apparatus was in great agitation, and when the sterno-maxillaris (the same as the sterno-cleido-mastoideus in man) was especially in action, the spinal accessory was divided. In an instant the sterno-maxillaris ceased to act as a muscle of respiration, but when the animal struggled to get free, it became rigid, showing that through the plentiful supply of spinal nerves it still retained its office of moving the head and neck."[†] That part of the experiment which relates to the cessation of the respiratory movements of the *sterno-maxillaris* being a negative observation, ought, we think, to have been repeated and further confirmed, before such important conclusions were drawn from it. I have removed a portion of the external branch of this nerve on one side as it issues from the foramen lacerum in seven dogs, without observing any change upon the ordinary voluntary movements of that side of the neck. It is possible, however, that if the animals had any violent voluntary efforts to make with the muscles of the neck, that those of the side on which the nerve had been cut might have acted less vigorously than those of the opposite side. I then proceeded to endeavour to ascertain the effects of the section of this nerve upon the involuntary respiratory movements of these muscles. The experiments were performed on dogs and cats.

---

[*] Fourth Report of British S. Association.

[†] London Medical and Physical Journal, Vol. xlix. p. 459.

The plan which I followed appears to me to be more likely to lead to accurate results than that adopted by Mr Shaw. In the method followed by Mr Shaw the animal might use these muscles voluntarily when the breathing was rendered difficult, and therefore lead to erroneous conclusions. Besides, the difficulty of recognizing the movements of any particular muscle through the skin of the animal, (at least in the kind of animals I operated on,) when so many other of the neighbouring muscles are in movement, must also be apt to mislead. The plan which I adopted was this. A small dose of prussic acid was given to an animal on which the spinal accessory had been previously divided on one side. After the convulsive movements produced by the effects of the acid had ceased, the animal was generally found in a state similar to what we sometimes see in apoplexy,—the action of the heart went on, and the respiration was slow, heaving, and performed at considerable intervals, while the sensorial functions appeared to be completely suspended. The animal had undoubtedly lost the power of making the slightest voluntary effort. The respiratory movements always ceased before the action of the heart, but they continued in several of these animals sufficiently long to permit us to lay bare all the muscles of the anterior part of the neck, and to make accurate observations. The *sterno-mastoids* in dogs and cats appear to have little action as respiratory muscles; for in some of these experiments, though the *sterno-hyoid* and *thyroid muscles* acted very powerfully in unison with the other muscles of inspiration, and the head was pulled towards the chest at each inspiratory movement, yet no contraction could be perceived in the *sterno-mastoid*, neither in the side on which the nerve had been cut, nor on that on which it had been left uninjured. In one dog, distinct muscular movements were observed in a bundle of muscular fibres, which arise from the humerus, run up along the outer margin of the *sterno-mastoid*, and are inserted along with it. This muscular bundle receives filaments from the *accessory*. In two dogs and one cat in which the head was fixed, and where these respiratory movements were particularly vigorous, distinct movements of contraction and relaxation were observed in the exposed *sterno-mastoid* muscles, synchronous with the other muscles of respiration. These were, perhaps, somewhat weaker on the side on which the nerve had been cut. In one of these dogs similar movements were observed in the *trapezius* on the side on which the nerve had been divided. From these experiments we conclude, that the *sterno-cleido-mastoideus* and *trapezius* can assist in the involuntary movements of respiration after section of the *spinal accessory*, and therefore it cannot be called the special respiratory nerve of these muscles. As far as we can observe, the functions of the external branch of the *spinal accessory* exactly resemble those of the filaments coming from the *cervical plexus*, with which it anastomoses so freely. Future anatomical researches may perhaps explain to us how it follows this peculiar course, without obliging us to suppose that it has a reference to any special function in the adult of the human species.

We now proceed to inquire what are the functions of the *internal branch* of the spinal accessory? We have already stated that Arnold, Scarpa, and Bischoff have imagined that the spinal accessory stands in the same relation to the *par vagum*, as the anterior roots of the spinal nerves do to the posterior. If this view be correct, the *internal branch* of the *accessory* must furnish the motor filaments of the *par vagum*, and upon it must depend the important muscular movements of the pharynx, larynx, and œsophagus. As no anatomist has yet succeeded in tracing for any great distance the filaments of the accessory, separate from those of the trunk of the *nervus vagus*, it is therefore impossible to decide this question satisfactorily by the anatomy alone of the nerves.* Bischoff proceeded to submit this opinion to the test of experiment, by endeavouring to ascertain what effects section of the trunk of the accessory within the cranium would have upon the voice. After relating several failures upon dogs, in which the animals either died from hemorrhage before the nerves could be fairly divided, or when they did survive the operation, it was afterwards found that the superior filaments of the nerve were left uncut; he informs us that he at last succeeded in performing the experiment in a satisfactory manner upon a goat. He states that it was remarked in this experiment, that, as the roots of the accessory nerves were cut, the voice became gradually weaker, and when the last filaments were divided it became completely lost. † It must, however, be apparent, that one negative experiment of this kind can never be adduced as satisfactory evidence of the dependence of the movements of the *larynx* upon the *spinal accessory*. There were here other causes in operation which might suspend the power of emitting sounds besides the section of the roots of the *accessory* nerves, and the simultaneous occurrence of the complete loss of voice, and the section of the last roots of the *accessory*, might not have stood to each other in the relation of cause and effect, but as a mere coincidence. The escape of the cerebro-spinal fluid, the unavoidable loss of blood, the exposure of the *medulla oblongata* to the external air, and the protracted pain and struggles of the animal, are more than enough to induce a state of stupor and debility sufficient to suspend its cries. In two attempts to repeat this experiment upon a dog and a cat, the animals died from hemorrhage before the nerves could be fairly exposed and divided. I then determined to try the effects of irritating these nerves within the cranium on an animal recently killed. I find that this method had been previously followed in one experiment by Müller.* In this experiment he ascertained that irritation of the *nervus vagus* within the cranium, both mechanically and by a single pair of galvanic plates, produced contraction of the *œsophagus*. As I was not aware that such an experiment had been made until I had completed those which I am about to mention, I could not be influenced in my observations by the authority of this very distinguished physiologist and accurate observer. I performed my experiments in the following manner. The animal was deprived of sensation by a dose of prussic acid, and the cranium was then opened as rapidly as possible. As soon as the nerves were exposed, the parts in the neck, which it was wished to observe during the irritation of the nerves, were quickly laid bare. The nerves were insulated from each other, and the animal was so placed, that while Dr Duncan and Mr Spence irritated the nerves, I could watch the effects upon the parts exposed. Some of the experiments failed from the facility with which these nerves are broken within the cranium, and from the enfeebled state of the muscular contractility, from the length of time required to go through all these preparatory steps. We procured, however, some results which I consider sufficiently satisfactory as far as they go. In one experiment, in which the *spinal accessory* was irritated by galvanism, when the aperture of the *glottis* was exposed, powerful convulsive movements of the shoulder were observed, but not the slightest movements of the muscles of the *glottis*. In another dog convulsive movements of the pharynx accompanied the convulsive twitches of the shoulder. In one dog in which irritation of the *spinal accessory* had produced powerful movements of the shoulder, the nerve was broken within the *foramen lacerum*, on attempting the irritation after the *glottis* was brought into view; the galvanic wires were then applied to the par vagum, and a distinct though feeble movement of the *arytenoid* cartilages followed, *unattended by any movements of the shoulder*. In another dog, a distinct movement of the *pharynx* and *arytenoid* cartilages followed the pinching of the insulated *par vagum* with the forceps. I attach most importance to this last experiment, as it is difficult in some cases to be quite certain that the galvanic influence is confined to the nerve operated upon, when others are placed in the immediate neighbourhood. From those experiments we think there can be no doubt that the trunk of the *par vagum* contains within it *motor* filaments independent of those which it receives from the *internal* branch of the spinal accessory. That the internal branch of the spinal accessory assists in moving the muscles of the pharynx we are satisfied, not only from the experiments just stated, but also from those upon the pharyngeal branch of the *par vagum*. Of the probable destination and functions of the other filaments of the *internal* branch of the *accessory*, we cannot pretend to judge without more extended inquiries. We certainly do not consider that these experiments entitle us to assert that they are not motor filaments.*

---

* Since this was written I have seen in No. iii of Müller's Archives for this year (1837,) an epitome of the investigations of Bendz, "De connexu inter nervum vagum et accessorium." From these dissections, it is concluded (Jahresbericht, &c. in Jahre 1836, p. xxv.) that both in man and animals, the *nervus pharyngeus* of the *par vagum* is derived in a great part from the filaments of the accessory, and that the *nervi laryngi*, *superior* and *inferior*, and the *œsophageal plexus* also receive a *few* filaments from this nerve. He has also observed the accessory in man, (p. xxiv.) furnish a few filaments to the second ganglion of the *par vagum*. Into this second ganglion of the *par vagum* all the filaments of the vagus do not enter. He has even seen in the rabbit some of the filaments of the vagus pass the superior ganglion placed on this nerve, without entering into its formation.

† Oper. cit. p. 94.

---

* Handbuch, &c. Erster Band, p. 641.

I may here state, that the arguments adduced from comparative anatomy, in favour of the opinion, that the spinal accessory is solely connected with the involuntary respiratory movements, may be considered as completely controverted by late researches. Serres has discovered its existence in some birds; Weber in some fishes; and Bischoff in birds, fishes, and reptiles.

These experiments upon the glosso-pharyngeal and spinal accessory have furnished results in direct opposition to the respiratory system of Sir C. Bell; for certain supposed functions of these nerves have been considered as forming one of the principal strongholds of that ingenious and plausible theory. I think there can be no doubt, that the distinguished discoverer of the distinct functions of the anterior and posterior roots of the spinal nerves, has taken a very limited and partial view of the sympathetic movements of the body, when he framed his respiratory system. His attention appears to have been so entirely absorbed by those connected with the respiratory function, that he seems to have forgotten that there are other extensive associated and sympathetic movements of the muscles of the body, besides those which he has so beautifully illustrated. For it is obvious, that, if a particular tract of the spinal chord is necessary to carry on the respiratory movements, there ought also to have been a defecatory tract, a urinary tract, and so on, to carry on the other sympathetic movements in which a number of distant muscles are engaged in simultaneous action. If the other associated movements can go on without it being necessary that the nerves supplying the muscles engaged in these, should come from particular tracts of the spinal chord, then surely there can be no necessity for this in the case of the respiratory nerves. The insufficiency of Sir C. Bell's theory to answer the ends proposed has been pointed out in a most satisfactory manner by Dr Alison in his elaborate essay on Sympathy.* It appears to me that physiologists have been exceedingly premature in framing new systems of nerves to carry on the sympathetic and instinctive movements of the body. For I believe that it will be found, that all the nerves of the body which can transmit the influence of volition can also transmit the influence by which the muscles they supply are called into sympathetic movement, and that the reason of some muscles being called more frequently into sympathetic action than others, does not arise from any difference in the nerves supplying these muscles, but from a difference in the circumstances under which they are placed. We term the muscles of the extremities muscles of strictly voluntary motion, though we admit that when a person is falling forwards, the arms are instinctively thrown in front,—in other words, some of these muscles contract without our volition, and through means of an influence sent along the same nerves by which they are called into voluntary action. In the same manner, when the foot of an infant is pricked, the leg is instinctively drawn upwards; and the involuntary start of surprise is sufficient to show that the respiratory are not the only muscles of the trunk which are involuntary in their action. The respiratory muscles are said generally to be partly voluntary and partly involuntary; but it appears to me perfectly obvious, that they are as much muscles of voluntary motion as those of the extremities, and that the reason of their so frequently receiving the name of involuntary arises from this, that, though properly voluntary, they are so much more frequently called into action by impressions accompanied by sensations than other voluntary muscles, that this has attracted the attention of physiologists to them in particular. We have seen that the muscles of the extremities (which every one calls muscles of strictly voluntary motion, to distinguish the mode by which they are stimulated to contraction, from that of the heart and muscular coat of the intestines,) perform associated movements without our volition on the excitation of certain impressions and sensations, and they obviously differ in no respect from the muscles of respiration, except in the relative frequency with which those involuntary movements are performed. This difference in the relative frequency of the action, again, evidently depends only upon the circumstances under which they are placed; for it is absolutely necessary for the preservation of the individual that the impressions arising from the want of fresh air in the lungs be frequently and regularly repeated, while the other sensations to which we have referred can be only occasional and accidental. It is obvious from these remarks that we do not object to the application of the term, muscles partly of voluntary and partly of involuntary motion, on account of its want of correctness, but because it is apt to mislead, for it may either induce us to believe that these respiratory muscles have at times some analogy in their mode of excitation to the heart and muscular coat of the intestines; or, what is more likely, that there is something specifically different between the nerves by which they are stimulated to contraction, and those distributed upon the muscles of the extremities. We believe that there are no muscles in the body which do not also sometimes deserve the name of involuntary, though the relative number of their involuntary movements may be far inferior to the strictly voluntary. If these views be correct, there appears to be nothing so peculiar in the action of the respiratory muscles, that they should require any distinct set of nerves.* How, or in what manner the influences of volition and of certain impressions and sensations are invariably directed along certain motor nerves in preference to others, is at present and probably ever will be, an utter mystery. The ends for which these sympathetic and instinctive actions were designed are obvious, but we have not been able to perceive any particular structural arrangement of the nervous system specially connected with their manifestation.

---

* The dissection of Bendz, to which we have already referred, seem to show that these filaments of the accessory are distributed upon the larynx and œsophagus. They therefore probably assist in the movements of these parts.

---

* Edinburgh Medico-Chirurgical Transactions, Vol. ii.

Though the sensitive and motor filaments of the spinal nerves appear to be separate from each other, and arise from distinct tracts of the spinal chord, yet it is not so with those arising from the upper part of this chord; and there appears to be some blending together of the motor and sensitive tracts of the spinal chord, when continued upwards into the *medulla oblongata*, which we cannot at present fairly explain. To say nothing of the *portio*

---

* I do not mean to deny, that it is possible that the motor filaments for transmitting the influence of volition may be distinct from those which transmit that sympathetic influence by which muscles are called into action in obedience to impressions made upon distant parts, and that those two sets of filaments may be bound up intimately together in the nervous chords distributed upon the muscles of the trunk and limbs. Since, however, we have no direct facts to guide us in a speculation of this kind, it is surely worse than useless to enter upon it. What we maintain is, that the *nervous chords* supplying all the muscles of the trunk and extremities, are capable of transmitting both the influence of volition and of sympathetic movement; and that, therefore, there is no specific difference between the nervous filaments supplying the muscles of respiration and those of the extremities.

dura and fourth pair, we find the *glosso-pharyngeal*, *par vagum*, and *spinal accessory* arising in the same line from the middle column of the spinal chord, and yet the filaments contained in these three nerves are partly sensitive, and partly motor; for no one can deny that the muscles of the *glottis* can and do frequently act from volition. It is possible that some of those motor filaments are furnished by the band of fibres which Mr Solly * has lately described as passing across from the anterior column to the *crus cerebelli.* A good deal evidently still requires to be done, before we can expect any satisfactory elucidation of the anatomical arrangement of these columns of the spinal chord, and their relations to the different nerves attached to them. We find, for example, Bellingeri and Sir C. Bell, two of the latest and best authorities on this subject,* differ with regard to the origin of the posterior roots of the spinal nerves; for while Bellingeri † describes these posterior roots as arising partly from the posterior column, partly from the grey matter in the posterior collateral groove, and partly from the middle or lateral column, Sir C. Bell has renounced his former opinion, that they come from the posterior column, and now describes them as arising from the middle column. ‡

Art. V.—*Observations intended to illustrate and determine the essential nature of Inflammation, deduced from its phenomena.* By G. Hume Weatherhead, M. D., Member of the Royal College of Physicians of London, &c. &c.

Notwithstanding the common occurrence of inflammation as a form of disease, yet no two writers on the subject exactly agree in the definition of it, and great as have undoubtedly been our advances in pathological knowledge of late years, it still remains a question to be answered, "What is Inflammation?" Now, though fully sensible of the great difficulty attending the attempt, it will be the object of the following observations, to endeavour to solve this problem of pathology, and, by a careful analysis of the phenomena of inflammation, determine the first *sensible* deviation from healthy action, and from thence, as a source, deduce all the ensuing phenomena, whether symptoms or results, as one consecutive series of effects, dependent for their relations on one another.

But before entering upon the investigation of the subject, it will be proper, first, to enumerate the symptoms characterizing inflammation in general, and after having examined the nature of these in their simplest and most ordinary form, the next thing requisite will be to illustrate those modifications of the phenomena which, either from peculiarity of structure, habit of body, or of constitution, alter them so greatly as frequently to make the same morbid action appear almost a different disease.

---

* On the Human Brain, &c. † Oper. cit. p. 69.

‡ On the Nervous System, p. 234 and 238, edit. 3d. Sir C. however, adds in a note, p. 234, that it is not impossible that the posterior column may be connected with the sensitive root of the spinal nerves, though he has not hitherto succeeded in tracing it.

It is this great diversity of features, indeed, that has rendered inflammation so difficult to define; for while one case shall present one particular symptom in a well-marked manner, in another instance it will be entirely wanting. Still, I trust, I shall be able, before concluding the subject, to get rid of this apparent discrepancy, by assigning to each event its proper explanation, and by fixing on one morbid condition,—one primary pathological phenomenon, that shall be found invariably attendant on inflammation, in whatever state of the system it may occur, and in whatever tissue of the body it may be situated.

The symptom of inflammation first manifest to the senses, when seated externally, is an increased redness of the part. This is immediately followed by an augmentation of its temperature; more or less of tumefaction for the most part soon afterwards ensues, according to circumstances, which will shortly be noticed; and, withal, there is more or less of pain. Now, it is almost needless to observe, that all the foregoing symptoms originate in a morbid condition of the nerves of the part; for all the phenomena of the living system, whether morbid or healthy, when ultimately traced, have the same origin. It is the excitation of the nerves which determines, in the first instance, the rush of blood to a part irritated. But, as we remarked at the commencement of these observations, our present investigation is concerned alone with the *sensible* deviations from healthy action that occur in inflammation, and not with an examination into the nature of that yet unknown power which directs and governs every vital phenomenon.

Blushing presents the penumbra of some of the primary symptoms of inflammation. Nervous excitation, for a moral emotion is of this nature, throws the blood on the cheek, and the part burns with a sensible heat. In blushing, the increase of vascularity fades as the emotion giving rise to it subsides; but the phenomenon is instructive, inasmuch as it proves how readily vessels can, to a certain extent, be dilated, allowing red globules of blood to enter capillaries, that, in their ordinary condition, convey only the colourless part of it, and shortly afterwards contract to their natural size, without any morbid consequence ensuing.

Certain degrees of inflammation are almost as evanescent as blushing; as, for example, where the conjunctiva is slightly inflamed from travelling in the dust in the heat of summer—washing the face and eyes with cold water frequently affords instant relief, and a night's rest, even when more severe, is often sufficient to remove every vestige of the complaint.

The first symptom of inflammation when fairly instituted, is, as has already been observed, an increased redness of the part. This is immediately followed by an augmentation of temperature, and shortly afterwards by tumefaction, tension, and pain. Let us now trace the origin and sequence of these several symptoms, that we may arrive at the dependence they have on one another as a series of consecutive results.

The increased redness of an inflamed part is obviously produced by an increase of the quantity of blood in the vessels generally, but more particularly by the red globules getting into vessels that do not carry such in their natural state. This circumstance appears most manifestly in the eye when its conjunctival tunic is inflamed. However, the fact itself requires a reserved acceptation as far as regards the simple quality of colour.

By the term " red globules," we are not as a matter of course to understand that there is always, or that there must be a real difference between those globules of blood which appear coloured, and those which are colourless. Cólour, we all know, is not an inherent or intrinsic property of matter; it is merely a reflection from its surface. Now, the red colour of the blood is a property dependent in a great measure, it would seem, on the *size* of the globules themselves; and the fact is beautifully illustrated in the vessels of some of the delicate tissues of the eye, such as the capsule of the lens, in which the globules become so minute in the ultimate extremities of the capillary arteries, as to lose the property of reflecting the red rays of light, and hence appear colourless. They remain so at the commencement of the corresponding capillary veins, until they become large enough by a *crescit-eundo* process, to regain their reflecting power, and again appear red. Now, in this apparent metamorphosis, if I may be permitted the expression, there is nothing but an optical illusion. There is no real change in the essential nature or constitution of the blood itself, except in the size of its globules.

Inflammation of the conjunctival tunic of the eye exemplifies the fact of red globules of blood getting into vessels that, in their ordinary and healthy state, convey globules so small as to be colourless. It is, in fact, but an *error loci*,—the circumstance upon which the celebrated Boerhaave founded his doctrine of inflammation.

Blushing proves, as has already been remarked, that the capillaries allow of being injected, yielding, for a time, to a certain degree of extension, and afterwards returning to their natural dia-

meter. Friction employed over any part of the surface for a short time is another example of the same fact. Now, this latter instance we shall find a valuable one in elucidating the essential nature of inflammation, and, if further prosecuted and examined into, will bring us, I apprehend, into immediate contact with our subject.

The first effect of an excitant or irritant applied to any part of the body is to attract the blood to the seat of the irritation, and to quicken its current in the capillaries; from these proceeds the efflorescence. If these effects be kept up beyond a certain period, or carried beyond a certain degree, the excitation continues to attract as much blood as before to its seat, while the power of the capillaries to forward it diminishes by the exhaustion ensuing from their prolonged over-action. As long as the increase of action in the capillaries is in a ratio with the increased supply of blood, inflammation cannot be said to exist; but as soon as the inverse of this takes place, by which one becomes disproportionate to the other, or, in other words, when the increase of supply continues, at the same time that the issue diminishes, this very circumstance constitutes and establishes that morbid condition we call "inflammation."

Now, though something similar to the above occurs in what is termed "congestion," there is this material distinction betwixt them; in congestion the blood is not removed by the capillary veins as fast as it is supplied by the capillary arteries, and so far the cases resemble one another; but the point of distinction and dissimilarity is this, that in congestion there exists no augmentation of activity in the supplying vessels; the vascular engorgement in congestion, therefore, is more particularly seated in the *capillary veins*, whereas in acute inflammation the plethora occurs principally in the *capillary arteries*. This is a circumstance not only of great importance to bear in mind in a practical point of view, but as one having an immediate relation with the second symptom mentioned as indicative of inflammation; the increase of temperature in the part inflamed.

Instances have already been adduced in proof of the power of the capillary arteries to obey the nerves of a part that is irritated in sending an increase of blood to the spot, and this too by an inherent power of action in the capillary system which is entirely independent of that of the heart. The phenomenon of blushing was one exemplification of the fact. We see the same take place in what are called "determinations of blood" to particular organs, say, for instance, the head, wherein the temporal arteries shall beat violently, and the face be hot and flushed, while the feet are icy cold. Now, the heart cannot of itself determine the blood to the head in particular, for its impulse it transmits with uniform force into both the ascending and descending arteries. Therefore, any inequality of impetus in the current of the blood must be given by the action of the conveying vessels themselves; for how else is it possible, on any principle of physics, to understand why the blood, issuing as it does from a common centre of impulse, should flow with increased strength and velocity towards the head, causing the arteries to throb, and the part to be hot, while in an opposite direction the feet are actually cold and the circulation languid and feeble? Other examples might be cited to prove more strongly still what power the arteries possess of carrying on, not only the capillary, but the entire circulation; such as cases in which the heart has been found ossified or wanting, and that singular affection to which John Hunter was subject, wherein this organ could not be felt to pulsate for hours, but only passively allowed a passage to the blood's current. In all such cases it is evident the circulation must have been performed entirely by the arteries; but as the discussion of this question is foreign to our subject, let us return to that of the increase of temperature as a symptom of inflammation.

Dr Crawford, in his physiological experiments on the blood, found that the capacity of arterial blood for heat was greater than that of venous, in the proportion of 1.03 to 0.8928, that is, greater by somewhat more than one-tenth. Arterial blood, therefore, in changing into venous in the capillary system, necessarily parts with this proportion of its latent heat. Now, when we call to mind that it is in this system, which is the primary as well as principal seat of all inflammatory action, and also that a larger portion of arterial blood than natural enters the vessels of a part inflamed, these facts, I conceive, will both satisfactorily explain and competently account for the increase of temporature attendant on inflammation. In a state of health this change of capacity only tends to sustain an uniformity of temperature between the extreme and central portions of the system, and especially to protect its surface against the abstractions of the colder bodies from without. It appears to be the process, in fact, which Nature has appointed for this express purpose, and it is only its inordinate augmentation that makes it a morbid symptom.

The power which the capillaries possess of evolving from the blood an extraordinary excess of heat, is exemplified in an eminent degree in scarlatina, and we, moreover, know that it is the capillaries forming the *rete vasculosum* that are principally involved in the pathology of this disease.

That the differences in the temperature of the animal fluids of the same body are ascribable to spontaneous changes that take place in their capacities for heat, is established beyond question, in my judgment, by the temperature of the urine compared with that of the blood. The matter of urine, we all know, is separated directly from the blood, the ordinary temperature of which is about

98°, while, according to Dr Hales, that of urine is often as high as 103°. So much for temperature as a symptom of inflammation. We now come to the consideration of one not less interesting or important,—that of tumefaction.

It was observed in a preceding part of this paper, when treating of redness as a symptom, that there was a rush or determination of blood to the part inflamed. It is necessary, however, to understand that the augmentation of activity in the arterial capillaries ceases at the point where the *error loci* we spoke of properly begins. In fact, it has been clearly ascertained by microscopical observations, that, beyond the point alluded to, the blood in the capillaries of an inflamed part, though much augmented in quantity, actually circulates slower than natural. Now, the obvious consequence of this must be a state of hæmastasis. The thin coats of these minute vessels, now rendered thinner, and therefore weaker by over-distension, are unable to forward their contents with the ordinary facility and rapidity, and hence a state of partial stagnation and engorgement becomes a natural result.

When the seat of diseased action is of small extent, not very sensitive, nor yet very vascular, the consequences of this partial stagnation of the blood are entirely local. But the result is very different if the inflammation be extensive, or if the organ attacked be both sensitive and vascular, and they are caused in the following manner. There is a state of hæmastasis in the capillaries, as has been said, and yet the ordinary quantity of blood continues to be sent towards them by the larger arterial trunks. Now the evident effect of this must be not merely to increase the hæmastasis; but as every point of stagnation in the capillaries offers a point of resistance, it follows as a mechanical consequence, that the impulse of the recoil must return to the heart as the original instrument of the propulsion. The heart, we know, to be an exceedingly sensitive organ, and stimulated as it now is by retropulsive shocks repeated alternately with its own systoles, it is thus excited to stronger and still more frequent contractions. The increased energy of the heart's contractions reacts again with augmented force on the disabled and over-gorged capillaries, and through a continued succession of such actions and reactions, we have instituted one of the most characteristic symptoms of symptomatic inflammatory fever,—a strong, full, and frequent pulse; and as this state of the circulation is universal over the body from its proceeding from the heart, we have at the same time an universal increase of temperature.

It were needless to insist, since the tenor of the preceding observations implies it, that it requires a certain degree and extent of stagnation to exist in the capillary system, before this can react effectively on the heart, and hence it is that we find many local inflammations neither influencing nor at all disturbing the general circulation. Febrile action, except as a secondary affection or symptom, does not appear to be essential to the character of inflammation, since we often see all the phenomena of the disease existing in distinct and active operation, and attaining all its forms of termination, and yet without any accompanying fever. There are other ways in which symptomatic fever is excited in inflammation, but a more appropriate opportunity than the present will hereafter offer to revert to them.

One cause of the tumefaction that usually attends inflammation as one of its symptoms, is obviously attributable to the excess of blood attracted to the seat of morbid action, and its stasis, when it arrives there, in the minute vessels of the part. If the texture of the latter be loose, the degree of swelling from this cause will be proportionally great, provided the parts be equally vascular. Hence we find that tumefaction, as a symptom of inflammation, is always greatest, relatively to the violence of the action, when seated in loose cellular tissue. Indeed, whenever there exists little or no cellular membrane, in the ordinary acceptation of the term, in the tissue inflamed, as in the *pleura* or *peritonæum*, there is little or no tumefaction.

But though the lax structure of the interstitial cellular tissue permits the greater distension of the vascular tubes passing through it, and thereby of a greater degree of engorgement, there is yet another morbid phenomenon it is capable of evincing from its peculiar structure and function, that is still more a cause of the tumefaction than the simple engorgement of the vessels which I have just noticed.

Loose or interstitial cellular membrane is composed, as its name implies, of a congeries of cells, communicating with one another, and lubricated by a seroid halitus. This vapour in health is constantly being removed by absorption, *pari passu*, as it is effused, similar to what takes place in other serous cavities. Now, we know that whenever inflammation attacks a serous membrane, a large increase of its secretion immediately takes place. The stethoscope can clearly demonstrate this fact whenever the pleura is inflamed; autopsy shows it to exist invariably in the other serous cavities; and my purpose now is to prove that the same morbid phenomenon takes place whenever loose cellular membrane is the seat of inflammation. Nor can we wonder, even without further evidence than that furnished by its structure and function, that it should be so; for if cellular membrane be nought else than a continuous series of cells secreting a seroid halitus, every cell is, by all analogy, as strictly a serous cavity as that of the pleura, and therefore we might *a priori* have inferred both would be equally subject to the same morbid phenomena.

But let us demonstrate the fact by an instance that comes hourly under the cognizance of us all—I allude to the effects of cantharides on the skin. The application of a blister exemplifies in its effects all the phenomena of inflammation proceeding to, and terminating in suppuration—we have the redness, the heat, the pain, and lastly, the tumefaction. Now, while that portion of the swelling produced by the injection of the capillaries is comparatively trifling, that arising from the effusion of serosity into the cells of the cellular membrane, lying immediately beneath the epidermis, is often enormous. I am perfectly aware, that, in arranging vesicles and blebs under the head of inflammatory tumefactions, I do what is not usual; but as morbid physiologists, it becomes us to treat of things as they are in their strict essences, and not to be diverted from a train of investigation, because an incorrect idea or word interrupts the pursuit of it. I hope to show, before concluding these observations, that, in so describing the fact, I use a term that is pathologically correct, and that the *main* portion of the tumefaction of deeper seated inflammations originates from the same cause, viz. the effusion of serosity into the cells of the cellular membrane of the part.

Among the strongest evidences corroborative of the last mentioned circumstance is the pathological phenomenon of the spontaneous conversion of serosity into pus. It is a mistaken notion to entertain that the matter we call pus is secreted at first with the characters which distinguish it. The matter of pus is colourless when first secreted, even from an open ulcer, and it is only in consequence of a change it afterwards undergoes, including a period of ten or twelve hours, that it completely assumes the yellow, and what is known as the purulent appearance. Van Swieten was the first, if I mistake not, who proved this by experiment. This distinguished physiologist wiped off the matter from a healthy ulcer as fast as it was poured out on its surface, and found it on examination to be perfectly colourless, and comparatively limpid, resembling serosity, in fact, in all respects. Exanthematous pustules, also, will always be found in the first instance to contain a colourless, or at most a milky fluid, which becomes yellow only after a time. This fact is well exemplified in natural vaccinia, by which I mean cow-pox occurring in the cow, or in man inoculated directly from the cow. The fluid in the vesicle is at first quite limpid and colourless, and afterwards becomes inspissated, opaque, and purulent.

Again, whatever promôtes or provokes the secretion of serosity, is likewise capable of producing and promoting suppuration; and the facts above-stated make it plain, in my judgment, why it should be so.

M. Schwilgué, formerly physician to the Hospital of the Salpetrière, in his analysis of pus, has constantly recognized the same components, whatever may have been the tissue or viscus that furnished it; viz. albumen, gelatine, carbonate of soda, phosphate of lime, and muriate of soda—that is to say, the very same substances that enter into the composition of the *serosity* of the blood, and the fluid that is exhaled into the splanchnic cavities.

Again, it has been ascertained that the change from serosity into pus is owing to a peculiar alteration the albuminous portion of it undergoes, by its concreting into yellow opaque globules that swim in the gelatinous lymph—an alteration which is facilitated by the absorption of the more liquid parts of the serosity. From the experiments of Gendrin and Carswell, it would appear that this change is capable of taking place even in the blood-vessels. These morbid physiologists found that on exciting inflammation artificially in the foot of a frog, the irritant that was applied caused a rush of blood into the minute vessels, and the colourless capillaries were soon gorged with red globules which became stagnant. In the course of a short time these globules lost their redness, and assumed a purulent appearance—an alteration which both these gentlemen attribute to a conversive power possessed by the vessels, analogous to that exercised by them in secretion. Now, in my opinion, the change is entirely to be ascribed to that spontaneous alteration in the albumen we have just noticed, originating in a change of affinities that takes place among its chemical constituents when the blood is perfectly stagnant. Late discoveries have materially altered our ideas respecting the function of secretion, and instead of ascribing it to some mystical and incomprehensible power exercised by the vessels, of forming matters that did not already exist in the blood, the physiologists of the present day are more inclined to adopt the more simple and rational notion, that the secreted matter is formed in the extremities of the capillaries by a chemical action which takes place among elements that already exist in the blood. We now know that the principles both of bile and urine exist ready formed in the blood, and it has lately been stated that a saccharine matter has been detected in the blood of diabetic patients. But to return to our subject,

There is a secondary disease, oftener deemed a symptom merely than a morbid consequence, having its seat in the subcutaneous cellular membrane, and varying in its nature according to the cause, a brief review of which is capable, I conceive, of throwing illustration on the morbid physiology of the capillaries. I mean, anasarca, a disease which, when more partial, is named œdema. Both consist in an effusion of seroid lymph into the cells of the subcutaneous cellular membrane. When the result of a leucophlegmatic or exsanguine habit of body, the fluid is composed of watery serum, containing little or no albumen, and therefore incapable of undergoing that change which forms purulent matter. Nevertheless, the cause of its effusion in this case does not differ in its rationale, in my opinion, from that which has been shown to occasion the tumefaction of inflammation. In both there is a partial stagnation of blood or hæmastasis of the part; a state of engorgement naturally ensues, which, by forcing an inordinate quantity of the more liquid parts of the blood into the exhalants that open into the cells of the cellular membrane, produces the principal tumefaction in phlegmonous inflammation, and that which we call œdema in cuticular dropsy. As the blood in the latter instance is, for the most part, thin and watery, so consequently are the exhalations that proceed from it.

That the composition of the fluid which is effused in these cases modifies the result is shown, not only by the formation of purulent fluid in the one instance, and that of dropsy in the other, but by the fact, that all solid morbid growths, not encysted, derive their origin from the same source. The nucleus of all appears to be formed of a matter thrown into the cells of the cellular membrane, where, though its watery parts are absorbed, its albuminous portion remains, which, by coagulating, forms a nidus for the contiguous capillaries to shoot into and thus to organize it. Now, in these cases it seems that the albumen is great and the lymph small in quantity,—a circumstance in all probability depending on a functional peculiarity of the cellular membrane of the part itself, since morbid growths, however sensitive they themselves may become, usually are seated in parts of no great sensibility, and where the cellular membrane is dense in structure, and not much of it at the same time; while, on the contrary, suppuration most frequently and readily occurs where the cellular membrane is abundant, lax, and vascular.

Having now reviewed the various circumstances that influence and regulate the production of purulent matter, I beg still to claim the reader's attention, before concluding this subject, by making a few observations on the formation of an abscess.

By facts deduced from a variety of physiological and pathological sources and circumstances, I have shown that purulent matter is produced from serosity, but dependent, notwithstanding, on certain special circumstances that seem essential to its formation. Now, when the serosity effused in cases of phlegmon is not reabsorbed, and the disease, therefore, does not terminate in resolution, as this event is termed, it undergoes that change already spoken of, wherein the albumen separates into yellow-coloured globules, at the same time that a portion of the watery part of the serum is removed by the absorbents, thus rendering the matter thicker. It is converted, indeed, by this change into purulent matter. As the inflammation proceeds, fresh serosity continues to be poured out, and, undergoing the same change, it accumulates at length in such quantity as to rupture the septa of the cells of the cellular membrane containing it, and thus comes to be collected in one cavity. This is what we call an abscess. The process is, in fact, the same as that which takes place in the formation of a bleb from the application of cantharides, only that the latter is quicker; the septa of the vesicle which is first formed break by the suddenly increasing distension, and the serosity which, in a vesicle, is contained in numerous cells that require repeated punctures of a lancet to evacuate them, is in a bleb contained in one cavity or bag, and is completely evacuated by a single puncture.

There are many collateral facts and circumstances which, to the experienced practitioner and anatomist, will spontaneously present themselves in support of these views. For example, the tumefaction is always greatest where the cellular membrane most abounds. We have only to recollect what sometimes occurs in conjunctivitis to find another proof in corroboration. I allude to the supervention of chemosis, where the effusion of serosity into the cells of the subconjunctival cellular membrane is both so apparent and so profuse as to make the pupil appear as if sunk in a pit. Again, suppuration is always rare, sparing and difficult in textures that are solid and firm, and which have little cellular membrane. The serous and fibrous tissues seldom suppurate, and when they do, it is always slowly and parsimoniously. Whenever pus is found along with serosity, the latter is always in considerable quantity, at least in the early stages of the effusion. It is frequently so met with in the cavity both of the thorax and abdomen. Even the milkiness of serosity in either cavity, I am inclined to regard as an imperfect example of that change by which serosity becomes purulent; it is a separation, in fact, of the albumen from the other components of the serosity, though not so complete as to form purulent matter; and milky serosity, we further know, readily coagulates by heat.

There are certain other seroid secretions that are not prone to undergo the purulent change we speak of; for example, the serosity poured into the ventricles of the brain in consequence of vascular engorgement is not readily convertible into purulent matter. This ready tendency of serous fluid to become purulent, appears to depend a good deal on the texture of the membrane secreting it, and the acuteness of the inflammatory action. Subcutaneous cellular membrane, when acutely inflamed, is of all others the most prone to suppurate, and hence common phlegmon, which has its seat in this tissue, is the inflammation that most frequently terminates in an abscess. A boil, on the contrary, which has its seat in the dense structure of the corium, suppurates with the greatest reluctance.

The *serous* membranes lining cavities form the natural sacs of their own abscesses, whereas the *seroid*, that is, the cellular, have a tendency to extend their abscesses in the direction of the least resistance. Hence matter situated under strong fasciæ follows the tract of the pressure, and points where that is least; and when matter forms under the skin it observes the same law,—it attains the surface from the operation of the same mechanical cause, *i. e.* pressure; but in this case it is the pressure of the atmosphere that is the agent, which, by pressing on a fluid surrounded by solids, necessarily forces it to point where there is the least resistance, and we know that must be over the centre of the fluid itself, as the point most removed from support. We therefore perceive why a subcutaneous abscess always breaks about the centre.

Having treated in consecutive order on the redness, the heat, and the tumefaction usually attendant on inflammation, we now come to the fourth most ordinary symptom of this disease, that is, the pain.

No symptom distinguishes the particular tissue in which inflammation is seated more than the particular character of the pain accompanying it. The specific terms by which this symptom is variously designated are most of them evidences of the fact. Pain may be acute, dull, heavy, or obtuse; it may be burning, corroding, pricking, itching; it may be throbbing, pungent, lancinating, tensive,—all of which, and many more, were it necessary to enumerate them, depend mainly on the nature of the tissue which is the precise seat of the sensation. Now, though many of these may exist in numerous instances without the presence of inflammation, yet several among them very frequently denote, not only the existence of this morbid state, and the stage at which it has arrived, but likewise the particular tissue in which it is seated. For example, the pain of *pleuritis* is very different from that of *pneumonia*, the one being an inflammation of the serous membrane, the other of the parenchymatous structure, of the lungs.

Pain, as a consecutive symptom of inflammation, is principally occasioned by the distended state of the blood-vessels, extending or stretching the tissue or structure in which the morbid action is going on, and, *cæteris paribus*, it is always the greater the less distensible that may be. Hence in loose cellular and mucous membrane the pain of inflammation is never very acute, while, on the contrary, it is excruciating in serous, fibrous, and sero-fibrous membranes that yield to extension with the greatest difficulty. Inflammation of the conjunctiva exemplifies the one case, since, even when accompanied with the greatest chemosis, the pain is comparatively trifling. The same happens in inflammations of other mucous and cellular tissues that are naturally lax and yielding, whereas inflammation of any fibrous structure is attended with excruciating suffering. The sclerotica exemplifies this; and the agonizing pain that accompanies gonorrhœal orchitis has lately been ascertained to arise from the extension made on the *tunica vaginalis* by the effusion of serosity into it. However, in thus treating generally on pain as a symptom of inflammation, we are not to be understood as alleging that the greater or less severity of this symptom is to be taken as a measure of its degree of intensity. There are many organs of the body possessed of very little sensibility even when diseased, and which may, therefore, be violently inflamed without any great degree of pain. Of this character is the substance of several of the great viscera, as the lungs, liver, and spleen; even the brain itself, though the centre of the common sensorium, may be violently inflamed, without any intense degree of pain, provided the *dura mater* or its processes be not involved in the diseased action.

With regard to gangrene and sphacelation as phenomena of inflammatory action, very few remarks will comprise all that has reference to our present views.

The first is an imperfect form of the second; gangrene is the incipient stage of sphacelus. There exists in all the structures of the body a certain quantum of vitality, which appears to derive its power from the integrity and perfection of the functions, more especially of the vascular and nervous systems. So inseparable in their reciprocal dependencies do these two systems appear to be, that if one of them be impaired or annihilated, the other is affected in a corresponding degree. Hence mortification ensues with indiscriminate readiness, whether it be the nervous influence or the supply of blood which is cut off from a part. However, in mortification proceeding from inflammation, the effect appears referable more immediately to the state of the vessels. Nevertheless, I am free to confess, that the question always confuses me, not so much to understand, as how to express myself accurately upon it. The vessels, we know, perform the circulation in part by the *vis a tergo* in the larger trunks; but in the capillary system, this function appears mainly attributable to the influence of the nerves. The first of these powers is a simple mechanical impulse, the second a vital one, acting in all probability on the muscular coat of the vessel. Therefore, we perceive that, in referring any act to the capillary vessels, ultimately applies to the nerves governing the action of these vessels, for it is intuitively obvious that vessels considered apart from this influence are mere passive tubes that convey, but cannot conduct or determine. With this reserved meaning, therefore, we may proceed.

The effect of acute inflammation, as has already been shown, is to cause the blood to circulate more slowly in the part affected, that is, to diminish the nervous influence which sustains the capillary circulation of the part. Now, if this effect goes on increasing in degree, which is a necessary consequence of the inflammation becoming more and more violent, the fact itself argues an increased atony of the nerves of the part, and consequently an augmentation of the hæmastasis, till at length the nervous influence becoming wholly extinct, the blood and surrounding textures are left, without the countervailing power which vitality possesses to avert it, to follow the laws of their natural affinities;—in other words, putrefactive decomposition takes place. In gangrene, as has been said, this ensues only to a partial extent. The vitality of the vascular and nervous systems is impaired, not extinguished, and when, either spontaneously or by medical assistance, these two systems regain their natural powers, the gangrenous part recovers its healthy structure and function. Sphacelation, on the other hand, is the entire disorganization of the part from a total extinction of its vitality. It may, however, be remarked in passing, that contiguity with a living solid seems to modify and somewhat control the process of putrefaction. The mortification of a part of the living body does not exactly resemble the corruption of the same part if completely detached from it, and other examples of the same circumstance might be cited, were it not irrelevant to our subject.

Before concluding this paper, there are still a few detached remarks I am anxious of introducing as corollaries in illustration of the positions and opinions I have endeavoured to sustain in the foregoing observations.

I regard, as I have already observed, the state of engorgement of the capillary vessels as the principal cause of the effusion of serosity into the cells of the subcutaneous cellular membrane, and, indeed, the means to which nature has recourse (analogous to numerous other functional phenomena preservative of health,) in order to relieve the vessels from the engorgement. Indeed, a principal use of the subcutaneous cellular membrane appears to me to be that of a reservoir extended over the entire surface of the body, to receive a portion of the circulation when, from some morbid cause, the blood in the superficial capillaries is stopped in its course, or when the emunctories of exhalation or of urine have ceased to evacuate the redundant fluid that has entered the circulation. The cells of this membrane, we know, are always kept lubricated by a seroid halitus, to prevent their agglutination; while the action itself preserves and at the same time continues the existence of the function, which I conceive the seroid vessels of the cells are appointed to perform when requisite.

Now, if we examine the different causes which produce serous infiltration, whether situated under the skin, in the substance of the lungs, or the brain, or into a serous sac, we shall find that it invariably is occasioned by vascular engorgement proceeding either from local or general debility, or from some great obstruction put in the way of the blood's current, such as a scirrhous liver, a disorganized spleen, &c. The effect of all these is to produce venous hæmastasis, to relieve herself of which nature pours out a large quantity of serosity into the cells of the loose cellular membrane, or, if the obstruction be in a viscus contained in a serous sac, such as the lungs, liver, or testicle, then the surcharge is emptied into the cavity of the pleura, peritonæum, or *tunica vaginalis*, as the case may be.

I have said that anasarcous effusions proceed from vascular engorgement; but in these cases there are certain peculiarities in the rationale of the process requiring explanation, especially when they ensue from debility, to illustrate which let us take œdema for the example.

In any general debility of the frame, the vascular system necessarily partakes. Now, in the upright position of the body, the venous blood in the lower extremities is propelled, as every one knows, at all times against gravitation; but, in a state of health, the forces circulating it are able to surmount this physical impediment to its return to the heart. This is not the case when the general system is debilitated. The blood then stagnates in the capillaries, and by thus producing engorgement, causes, in the manner already explained, effusion into the cells of the subcutaneous cellular membrane, or, in other words, œdema. The same effect ensues from a similar cause in certain cutaneous inflammatory affections, that involve in their action the subcutaneous cellular membrane, as happens in phlegmonoid erysipelas, and the latter stage of scarlatina. A ligature placed round a limb produces œdema in a manner physiologically the same, that is, it causes extreme engorgement in the superficial capillaries, by the direct stop it puts to the surface circulation in the veins.

If we investigate the morbid physiology of hydrothoracic and ascitic dropsy, we shall find the very same circumstance operating as the cause of the seroid effusion;—that is, vascular engorgement in the extreme vessels. Some time ago I met with a case of ascites, of which, as it throws, in my opinion, some new lights on the pathology of abdominal dropsy, proceeding from scirrhosity of the liver, and bears at the same time on the present point, I shall briefly narrate one or two of the leading particulars.

The patient had been tapped forty-six or forty-seven times, but at length died. Leave could only be obtained to examine the abdomen, on opening which, the peritoneal envelope of the liver was found studded with numerous patulent apertures on its anterior aspect, apparently the orifices of enlarged exhalants. By squeezing the liver, a pure serosity poured out freely from these orifices, resembling in all respects that evacuated by the tapping, and, trickling down to the edge of this viscus, it dropped in among the convolutions of the intestines. Now, that which the squeezing produced seemed to me to be an exact fac-simile of what had taken place in the production and reproduction of the dropsy during life. The vascular engorgement within the liver, caused by its state of induration impede the circulation of the blood through it, had relieved itself by effusing serosity through the exhalants opening on the surface of this viscus, and thus producing the dropsy. Such, indeed, I believe to be the rationale of the pathology of every case of ascites proceeding from an obstructed liver; the only peculiarity in the above case being the great dilatation of the orifices by which the serosity escaped. There were several of these apertures large enough to admit a common silver probe up them for full half-an inch. My friend, Mr Jeston, a highly respectable and intelligent practitioner, at Henley, on Thames, assisted at the dissection.

With the notice of this curious case I shall now conclude, not because the subject is exhausted; for it is capable of much more ample illustration; but that the further prosecution of it on the present occasion would exceed the usual limits of communications such as the present.

The principal endeavour in this paper has been to demonstrate the fact, that the most common and most pathognomonic symptoms of inflammation are a series of consecutive results, originating in one primary pathological phenomenon, viz. a destruction of that equilibrium of action which exists in health between the heart and larger arteries, and the capillary system; in other words, that the disproportion existing between the increased supply of blood to the part inflamed and the diminished issue from it, constitutes the morbid state we call "inflammation." Consecutively it was shown that this increase in the quantity of blood was the cause of the redness in inflammation; from this likewise proceeds the greater evolution of latent caloric, and hence the augmented temperature of the part. It was further attempted to be demonstrated how this same circumstance occasioned the tumefaction, directly by its presence in larger quantity, and indirectly by the effusion of serosity that ensued from the state of hæmastasis; and, lastly, that it was from the distension caused by the blood or effusion from it that the pain was produced, —the latter circumstance, of course, implying that the inflamed part was exposed to no accidental or extraneous irritant at the same time.

36, George Street,
Hanover Square, London.

ART. VI.—*Cases of Poisoning by Fungi, with Remarks.* By ALEXANDER PEDDIE, M. D.

CASE I.—Donald M'Bain, aged 57, accompanied by two of his sons, went about five in the morning of the 13th August, to the back of Arthur Seat, for the purpose of gathering mushrooms to fry. Quite ignorant of the difference between poisonous and harmless species, he consumed nearly a dozen of them in the raw state before leaving the spot from which they were taken. In about half an hour afterwards, (eight A. M.) when at Saint Anthony's Well, on his way home, he said to the boys that he saw every thing of a blue colour and in motion; and expressed apprehension as to the cause of his illness, and a desire to vomit. He accordingly tickled his throat with a straw, and succeeded in ejecting several mouthfuls of the fungi. He felt no pain in his stomach or bowels, nor any thing like cramps; but the giddiness was great, and gradually increasing, so that by the time he reached Holyroodhouse he was staggering as if much intoxicated, and was unable to articulate distinctly. When brought to Campbell's Close, at the foot of the Canongate, where he resided, (at half-past eight,) he was so lethargic as to require being carried into his house; and almost immediately afterwards was so insensible, as not to be roused to consciousness by the loudest sounds, or the most violent shaking. An emetic was immediately procured for him at a neighbouring laboratory; but as it failed to operate, notice was sent to Minto House, and Mr Clerk, one of the Dispensary pupils, saw him about half-past nine. Mr Clerk found him quite insensible, affected with great muscular tremor, at times much convulsed, and groaning deeply. A sinapism was applied to the nape of the neck and one to the epigastrium; and an emetic, a drachm of the sulphate of zinc, was given, and repeated again in about a quarter of an hour. As these means failed alike in exciting sensibility or vomiting, I was sent for. On visiting him at half-past ten, I found him in the most profound coma, or in something closely resembling that state, but breathing softly; affected with convulsive movements of the extremities, and with universal *subsultus*, with a cold skin, a pulse beating 68, and very feebly, but regular, and pupils much contracted and quite unaffected by light. Having removed him from bed and supported on a chair, I applied the stomach pump. This operation was continued until two or three gallons of tepid water had passed through the stomach, when the fluid became nearly pure and free from fragments of the fungi, which were at first brought up in great quantities; and before withdrawing the tube two ounces of castor oil, in half an English pint of warm milk, was introduced. During these efforts the pulse rose to 80, but remained weak; and his condition otherwise was quite unchanged.

At eleven, his pulse was 80, weak and sharp. A vein was now opened, and while the stream flowed, the pulse was counted through every quarter of a minute, and its strength carefully watched. Under this treatment it was satisfactory to find the beats gradually rising and becoming more soft and full; but when ten ounces of blood had been obtained, and when the pulse at the wrist, which was now 100, was beginning to fail, the stream was immediately checked, and the patient returned to bed.

By half-past eleven, the pulse had fallen to 88, but was much more soft and full than before. Cold water was now applied to the head, large sinapisms to the feet, and water almost boiling to the inside of the thighs. Until the last remedy was used, no symptom of sensibility had been obtained, but now, when first employed, he moved his legs very slightly, and with each successive application of the hot fluid, those movements became rather stronger, and were occasionally accompanied by low moaning.

At twelve, the pulse was 88, and possessing considerable strength. The boiling water had been constantly applied for the preceding half hour with flannel cloths; but several of the last applications having produced little or no effect in rousing sensibility, and there being as yet no vesications, I now poured the water boiling from the kettle on his thighs; no sooner was this done, than he turned round in bed, threw out his arms, and groaned loudly. On the continuance of the stream for a short time, he was much convulsed, and roared out lustily. His pulse, too, rose to 90.

At half-past twelve, the boiling water was still being applied with flannel cloths; and although the parts were considerably reddened, there was as yet no appearance of vesication. His pulse was 94, the pupils were dilated and distinctly contractile by the stimulus of light. He groaned frequently, but when spoken to exhibited no symptom of consciousness; and the *subsultus tendinum* continued great, with occasional tetanic spasms of the extremities. The sinapism, which had remained on the nape of the neck since half-past nine, was now removed, as the surface was well reddened and slightly vesicated. The scalding water was still continued to the thighs; and an English pint of hot coffee, along with two ounces of castor oil, was introduced by means of the stomach pump. The passing of the œsophagus tube roused him very much, even to resistance; and after the stimulant was lodged, he roared out in a most furious manner, and became violently convulsed.

At a quarter from one, his sensibility and excitability were much greater; for he rolled more about in bed, cried louder at each application of the hot water, and occasionally muttered,—

although quite unintelligibly, when loudly spoken to, or when forcibly shaken. His pulse was now 96, and of considerable strength; the pupils were dilated, but readily contractile; and the surface of the body, although still cold, had become of a higher temperature. The muscular twitchings still continued. As small vesications were now visible on both thighs, the hot water was discontinued.

At one, Professors Syme and Traill visited him; and I was advised by them now to trust chiefly to internal and external stimulation.

At a quarter past one, his symptoms were the same as when last reported,—only he had been lying very quiet. He was soon, however, so much excited by the introduction of the stomach pump as to require restraint; and after I had injected a teaspoonful of the *Tinctura Ammoniæ Aromatica*, along with a few ounces of hot coffee and milk, he struggled like a furious maniac, and roared out in Gaelic at the full pitch of his voice,—a language, by the way, in which he had not been heard to speak for many years. Cold was now applied to his head more assiduously than before.

At half-past one, he was much more easily roused and irritated when touched or spoken to; continued raving almost incessantly in Gaelic; and seemed to feel pain in the thighs and neck, as was evinced by frequent scratchings of these parts with his fingers. His pulse was 100, and pretty full. Another drachm dose of the *sal volatile* in coffee was now administered, but without requiring the aid of the stomach pump; and it had the effect of the previous one, in inducing a violent paroxysm of roaring and convulsive efforts.

At a quarter from two, he was lying quiet, apparently exhausted by the violent delirium of nearly the last half hour. Frictions, with warm turpentine, were now applied over the surface of the body, which was still considerably below the natural temperature; and a third dose of the *sal volatile* was given. Again he was much excited by its exhibition, and continued to vociferate loudly in Gaelic, occasionally interspersed with Spanish, which last language it would appear, he had partially acquired during his service in the peninsular war.

At two, he was still very restless, but perfectly manageable, and continued talking loudly and incessantly in Gaelic, imagining himself, as appeared from the interpretation of a person present, in the thick of one of the numerous engagements in which he had really acted during his career as a soldier. Although, however, he did not utter a single syllable in English, he seemed to have the capacity of thinking in it in some measure, for on one occasion he put out his tongue when requested in English to do so. His pulse was still 100; his skin warmer; his pupils widely dilated, but contractile; and the *subsultus tendinum* existed to a considerable degree. A tablespoonful of the following mixture was now ordered to be given every quarter of an hour. ℞ *Mist. Camphoræ, Alcoholis aa* ℥iv. *Tinct. Ammoniæ Aromat.* ʒss. *Aquæ* ℥ij. *M.*

At half-past two, his symptoms were as last reported. The stimulant mixture was continued, and other two ounces of castor oil given, as the former doses, amounting to four ounces, were yet retained.

I now left him in charge of his friends; and on returning at four found him sitting up in bed, with symptoms ordinarily characteristic of *delirium tremens.* His talk was incessant, and for the most part incoherent. He declared that he never was better in his life, felt no pain, and never had any, but was perfectly happy, and had just returned from a visit to Heaven, &c.

His pulse had now fallen to 96, but was much more full, and the pupils, tongue, and temperature of the surface, were all natural. The bowels were copiously moved about half-past three,—the evacuation being perfectly healthy, and containing no fragments of the fungi. The stimulating mixture was now ordered to be given only once in the hour.

On calling at nine P. M. I found him sitting up in bed, quite sensible and collected, expressing great gratitude for the exertions which he understood had been made for him, and detailing accurately, as has been given above, the time when he went out in the morning, and what he had done and felt before being carried into his own house. He declared that he had not experienced the slightest pain in the stomach or bowels, but that the head alone was affected; that the giddiness was felt within half an hour after the fungi were eaten; and that altogether the effects produced on him, so long as he was conscious, closely resembled those occasioned by large doses of opium, which drug he had taken several times in his youth. His recollection appeared to have been entirely suspended from the time when he saw his wife in his own close, and when he imagined at the same time that his house, as in a dream, was in a different situation from that which it really occupied, until the afternoon, when he felt his thighs and neck painful, and was aware of being spoken to and made to swallow medicines. Although now, however, perfectly sensible and free from pain, there seemed to be a considerable tendency to cerebral overaction, for he was excessively loquacious and irritable, and his pulse was 90, and very strong. The muscular tremors, too, were yet very considerable. On these accounts the stimulant mixture was discontinued; the head was ordered to be shaved, and cold constantly applied; and although the bowels had within the last three hours been moved several times, an additional purgative was administered.

14th. At half-past 9 A. M. his pulse was 88, full and soft; his tongue was a little red at the tip, but moist; he felt no pain anywhere but in the thighs, on which there were several large vesications, and indeed complained of little but debility. He had not slept during the night, but had been quiet; and his bowels were once very freely moved.

At half-past 6 P. M. I found him sitting at the fireside, complaining only of his thighs and weakness. His pulse was 100, full and soft. The cold was continued to his head; the compound jalap powder was ordered for the bowels; and a saturnine lotion to the thighs.

After this date he had no particular complaint; and no treatment was required excepting to the ulcers of the thighs, which, however, soon healed kindly.

CASE II. Angus M'Bain, aged 15, was with his father and brother* on the morning of the 13th August, but ate only one raw fungus. He felt a little giddiness when at St Anthony's Well; and when his father attempted vomiting by means of a straw, he did so too, and vomited very freely. After this he felt nearly well, excepting slight giddiness, and had no pain, but led his staggering parent home; and it was not until half-past eleven that he became excessively drowsy and unable to sit up. So soon as this approaching narcotism was observed, a grain of the tartrate of antimony, with some sulphate of magnesia, was given in a large quantity of tepid water; but this failing to excite vomiting, the stomach pump was resorted to. He then got an ounce and a half of castor oil in milk, and was ordered out into the open air to be walked about.

At 1 P. M. the tendency to sleep and giddiness were gone, but leaving a considerable feeling of weakness.

At 4 he was quite well, and had a free alvine evacuation.

Afterwards no symptom occurred worthy of being noticed.

CASE III. Edward M'Leod, aged 13, West Smith's Close, Grassmarket, went alone about five on the morning of the 22d August, to the same grounds to which the M'Bains had gone, to procure mushrooms, but from false information pulled the wrong species. While on the hill he tasted a raw one; but finding it rather unpleasant he spit it out, without swallowing a single fragment of it, or even any of the juice. He went home quite well, and breakfasted heartily at 9 o'clock on porridge and milk. At 10 he roasted six of the fungi, and feasted on them after having dressed them with butter and salt. In about half an hour after this repast, he felt exceedingly giddy, and went out to a green at the back of his house, where he lay down for a short while; but

---

* This boy only tasted one; but having spit it out immediately, he did not suffer anything from it.

as the giddiness increased, he staggered into the house again, where he vomited a little, and then went to bed, sleep being by this time irresistible. It was now eleven o'clock, when he fell into a profound sleep,—his parents all the while never suspecting that there was anything particularly the matter, as he had complained of no pain; for although they had seen him cooking and eating his mushrooms, they imagined that he had just been a little sick and fatigued, by having had an earlier and longer walk than usual. He was therefore permitted to sleep on without interruption. At half-past one, however, their fears were suddenly awakened, by his starting up in bed, raving loudly, and tossing his limbs about so much as to require considerable restraint. On application being made at Minto House, he was seen by Dr Brown and Mr Clerk at two o'clock. They found him raving wildly, affected with universal tremor, and occasionally with powerful muscular contractions, having a pulse beating 100, weak, but regular, pupils widely dilated, and a surface rather reduced in temperature. Two tablespoonfuls of mustard were immediately given by Dr B. in a quantity of milk, and thereafter the cold *douche* was administered on his vertex. This latter remedy had a considerable effect in quieting him; and by means of the former, speedy and free vomiting was induced. As he did not, however, appear to have vomited enough, four grains of the tartrate of antimony were given in a quantity of tepid water.

I saw him at half-past two. The antimony, although given about ten minutes before, had not yet affected him. He required to be held in bed, his pupils were widely dilated, and totally unaffected by light. He was incessantly raving all sorts of nonsense, apparently much alarmed. He was affected with unceasing spasmodic twitchings; and indeed the vibration of the tendons at the wrist was so great, as for a while to render the perception of the pulse, which was beating 100, and feebly, rather difficult. The stomach-pump was now applied, and tepid water passed through the stomach until it ceased to be tinged with the mustard given formerly as an emetic. No fragments of fungi, however, were obtained. During the operation of pumping, he resisted much, and raved more fiercely, while, at the same time, the pulse rose to 108, and became rather more full. An attempt was now made to get him to swallow two ounces of castor oil, along with a quantity of milk, but as he refused to admit it into his mouth, the pump was again resorted to.

At three, he was again put to bed, and a large sinapism applied to the inside of each thigh, while cold was applied to the head, and ordered to be assiduously continued.

At half-past three, he was still talking loudly and incoherently; but was not so boisterous, as to need restraint, and the *sub-*

sultus tendinum had nearly disappeared. His pupils remained fully dilated, but were slightly, although sluggishly contractile by light, and his pulse was 108, regular, and having more strength. The sinapisms did not yet appear to have been felt, and were therefore allowed to remain. Another ounce of castor oil was given, and afterwards a draught of hot coffee.

At half-past four, he was still incoherent, but more quiet, with a pulse 104, and of good strength. The sinapisms had been felt about four o'clock, and were then removed, as the skin was well reddened.

At half-past six, I found him in a sound natural sleep, into which he had fallen only a few minutes before. *The pupils were contracted*, but a little further contractile by light, and his pulse was 90, full, but very irregular. On being roused, however, which required forcible shaking, the pupils became *widely dilated*, and very little affected by light, while the pulse rose to 100, and became quite regular. When now roused he answered questions, but in a careless manner, and for the most part incoherently; and when left to himself was quite unintelligible. He complained very much of his thighs. As his bowels had not yet been moved, an ounce more of castor oil was ordered, and his attendants were desired to continue the cold to his head, and to shake him up out of sleep at short intervals.

At ten he was almost well, being perfectly coherent, having a pulse at 90, full but soft, and having had his bowels freely moved.

On calling next morning I found that he had passed a very quiet night; that his pulse was 80, soft and full; that his tongue was quite natural; and that his bowels were free. Indeed he complained of nothing besides weakness and his thighs, which were much inflamed, and a little swollen. An account of himself before losing recollection on the previous morning was now accurately given by him, and was precisely as has been stated at the commencement of the case.

On the 25th, he was at his out-door play as formerly.

The accuracy of the above reports may be implicitly relied on, as they are drawn from copious notes taken on the spot at the times to which they refer,—no particular, however trifling, having been left to recollection; and they are now given in all their minuteness of detail, from the conviction, that, if otherwise narrated, they would be deprived of interest and importance.

With regard to the particular species of fungus made use of in the foregoing cases, I have to state, that a specimen was taken from the stock brought home by the M'Bains, (all the individual plants of which were of the same kind,) and examined by Dr Greville, whose intimate knowledge of cryptogamic plants cannot be questioned, and by him pronounced to be the *Agaricus procerus.*[*] Dr G. being from home when the third case occurred, I was deprived of an opinion regarding those used at that time; but I am convinced, from careful comparative examination, that they were precisely the same agarics as those used in the first and second cases, and, moreover, additional evidence as to their identity may be derived from the circumstances, that the habitat was the same, and the effects produced in the different cases were very much alike, notwithstanding the different states and quantities in which they were used, and the difference of age and constitution of those who partook of them. I may further state, that, in order to avoid the possibility of blame being attached to the wrong fungus, I went on a subsequent day to the back of Arthur Seat in company with the subjects of the above cases, and having procured specimens of the species, which they unhesitatingly attested to be the only ones made use of, sent them to Dr Greville, who returned the same answer as before. On these grounds then, the *Agaricus procerus* is assumed to have been the noxious fungus used in all of the above cases; and it now becomes a matter of no small interest, that the same fungus has been mentioned by various authors[†] as an edible one; and by others[‡] at least, it has not been included in the list of those esteemed poisonous. Since, therefore, this particular agaric produced such deleterious effects in three (or at least in two) distinct cases, where difference of ages, constitution, and habit, renders the inference of a peculiar but common idiosyncrasy an extremely improbable conjecture; and since the poisonous principle or principles contained in it produced nearly identical effects when subjected to culinary preparation, as well as when used in the raw state, (for had it been used raw on all the occasions, the matter would have been very different,) it follows, that it ought to be viewed with suspicion in this country at least,—even although it has found its way to continental tables[§] in the forms of *fricassées*, or as ingredients in *sauces.*

---

[*] "Agaricus procerus elatus, pileo squamoso, late umbonato, rufescente—cinereo, lamellis albidis, remotis, stipite annulo mobili, bulboso."

[†] Persoon, Traité sur les champignons comestibles, p. 157. Greville, Memoirs of the Wernerian Society, Vol. iv. p. 353. Christison on Poisons, 2d edit. p. 769.

[‡] Orfila, Toxicologie Générale, ed. seconde. Tome ii. 385–411. Fodere, Médecine Légal, Tome iv. seconde partim, chap. iii. p. 57.

[§] Dr Greville, Mem. Wer. Soc. Vol. iv. p. 353, and in the private note to the author, accompanying his opinion on the specimens of the Fungi transmitted to him. In stating this, however, it ought to be remarked, that difference of climate is well known to change materially the qualities of other species of fungi,—as in the case of the *Agaricus piperatus* and the *Amanita muscaria*,—the first of which is eaten with impunity in Prussia and Russia, (Haller, Hist. Stirp. Helv. Indig. ii. 328.) although poisonous in France, and the last virulently noxious in France and in this country, although affording a common intoxicating beverage to the people of Kamschatka, As to the nature and effects of the poison brought into action in the above cases, some interesting topics for remark present themselves. The poisonous fungi have by all writers on poisons been arranged with the narcotico-acrids,—a class of poisons which excite at once narcotism and irritation, which produce a local irritating effect, as well as an effect on the brain and nervous system generally. This arrangement, however, has been qualified by the assertion, that the *modus operandi* in different cases, even with the same poisonous plant, may be various,—in one acting more or less narcotically, and in another producing a greater or less degree of irritation; and likewise that these effects vary according to the size of the dose,—the larger quantity being more narcotic, and the smaller more irritant.*

Whether this rule can be assumed as a general one or not, the cases at present under analysis, although resulting from the use of three different quantities of the fungi, were all cases of pure narcotism; for in none of them was the slightest pain of the stomach or bowels complained of, nor indeed was there any symptom present during the whole affection indicating irritation of the mucous surface, but every feature in them attested an impression made on the nervous system alone.

It has been stated by various writers on poisons, when remarking on the general rule that narcotic and narcotico-acrid poisons produce their effects on the system in a very short space of time, that the poisonous fungi must be considered as exceptions, as they "seldom begin to act for several hours, sometimes for not less than a day and a-half" after being taken.† To this statement the above cases present some contradiction, for in all of them the effects began to be developed within the space of half an hour.

With regard to the kind of impression produced by the poisons on the brain and nervous system generally, the above cases present several curious circumstances for consideration. The stupor in case No. 1 was much more profound than that observed in any of the cases of narcotic poisoning with which I am acquainted; for while in general a look or word, momentary it may be, is obtained from those poisoned with opium, and other narcotics, affording proof that they may be roused from the stupor, if not already moribund, yet in this instance a very long time elapsed before the slightest symptom of sensibility could be obtained, in spite of loud speaking, forcible shaking, and various other means even more powerfully rousing. Indeed in this case it was not like the com-

---

(Dr Langsdorf, Annalen der Wetterauischen Gesellschaft für die gesamente Naturkunde.)

* Christison on Poisons, p. 717.

† Ibid. p. 580; also Orfila, Tome ii. p. 409, edit. seconde. Beck's Medical Jurisprudence, p. 937, last edition.

mon narcotic lethargy, but more resembled coma, wanting the stertorous breathing; and this state was still further remarkable from its being accompanied by muscular twitchings and spasms in addition to the contracted pupil, the low feeble pulse, and the cold surface. The convulsions and severe tetanic spasms too, which occasionally occurred during the development of sensibility, and the boisterous delirium which followed them, gave a singular character to the whole case. The order in which those phenomena occurred seems different, so far as I am aware, from that hitherto observed in cases of narcotic or narcotico-acrid poisoning. In such the delirium has invariably preceded convulsions and stupor, but in cases No. 1 and 3 it was subsequent. Instead of the sedative stage following that of excitement, the reverse happened; and if there really was excitement prior to the stupor, the case is rendered more curious from the recurrence of it afterwards,—which excitement too, could not altogether be the effect of the stimulating remedies employed, as the delirium occurred in case No. 3, before any medicines were given at all. Indeed, from all the circumstances in cases No. 1 and 3, the idea does not seem inadmissible, that more than one poisonous principle existed in the fungi; and that after one of these had exerted a full narcotic influence, another was eliminated, by which the energies of the brain and general nervous system were excited, and thrown into disorder.

The only other remark which I shall offer on the phenomena observed in cases No. 1 and 2, is on the curious changes in the condition of the pupil. In the elder M'Bain's case, *during the stage of perfect insensibility*, the pupils were *very much contracted*, and were *unaffected by light*; but when *the system was roused to the fury of delirium*, they became both *widely dilated, and were to a considerable degree sensible.* In the boy M'Leod's case, it is unfortunate that the state of the pupils could not be ascertained during his sopor. When seen first, however, and while he was in the height of delirium, they were *widely dilated but quite unaffected by light*, and only increased in contractility as the delirium passed away. Another singular phenomenon of M'Leod's pupils was that which was observed at half-past six (P. M.) Such changes as the last, however, I have of late very frequently observed in the course of different affections of the head, particularly in those of children. When asleep or lying quiet, the functions of the brain being undisturbed, the pupils are often contracted to a very small size; but when the patient is roused by any sort of irritation, more especially by forcible pressure on the epigastrium, the pupils may be suddenly dilated to their full extent, and often while in this state refuse to contract even by the most powerful stimulus of light. This curious vaccillation of the pupils, and indeed their very variable phenomena in different states of disease, only shows that symptoms derived from the state of the pupils cannot, in the present state of our knowledge, be much depended on as precise and invariable indications of particular cerebral conditions.

It would be superfluous to enter particularly into the nature of the treatment pursued in the above cases; but it may not be useless to call attention to some of the remedies employed, and to the effects which they produced. The *emetics* of zinc and antimony failed to act, while the mustard one had the desired effect, most probably because it was hot and stimulating. The *stomach-pump* secured the best results. By no other means could the contents of the stomach in case No. 1 have been discharged; and by it even a great many fragments of the fungi were brought up. And although the virulent properties of the poison had evidently been extracted, and perhaps entirely conveyed into the circulating system, yet the operation was a powerful means of excitation, on the first introduction causing a rise of the pulse from 68 to 80, and on the second occasion, while the stupor still existed to a considerable degree, rousing the patient to active resistance; and in case No. 3 this last effect was likewise sufficiently produced. On this principle I used it lately in three very desperate but ultimately successful cases from poisoning by laudanum,—not with the hope of extracting the smallest quantity of the drug, which had already too evidently produced its full constitutional effect, but as one of the best means in itself for exciting the patients, and at the same time securing a safe passage for other remedies into the stomach which could not otherwise have been obtained. The *bleeding* in M'Bain's case was an experiment, but apparently justified by the indications of cerebral congestion present, and the result showed the efficacy of the practice. The *counter-irritation* employed in case No. 1 was perhaps the most powerful agent in procuring a first step in the return of sensibility, and in securing the patient likewise against future mischief. The boiling water, although a severe remedy in appearance and in after consequences, seemed called for by the urgency of the case, and the immediate and subsequent effects demonstrate clearly enough the advantages obtained from it. The large sinapisms in No. 3 were of great utility. It is certainly not presuming too much to conclude, that convalescence in both of these cases would neither have been so speedy nor complete had it not been for the extent and permanency of the irritation obtained. The admirable effects of the *internal stimulants*, viz. the coffee, the ammonia, and the spirits and camphor given in case No. 1, appear so obvious from the various reports as to render any comment unnecessary. As to the *purgatives*, the castor oil was preferred, and exhibited along with milk, on the supposition that there might have been an acrid as well as a narcotic principle in the fungi, from which it was necessary to shield the stomach and bowels, while at the same time it seemed best fitted for acting speedily downwards. It was rather interesting that the torpor of the bowels should have been so great in both cases as to require in the first one six ounces, and in the third four ounces, before an evacuation could be procured. In conclusion, whether owing to the plan of treatment adopted or not, it certainly is not the least striking feature in cases 1 and 3, that there should have been so early a restoration to health when the poison acted so speedily and violently; and even although there had been subsequently a very material derangement of the constitution, such could not have been wondered at, considering the number and kind of remedies which it was necessary to employ.

ART. VII.—*Case of Presentation of the Face, in which sphacelus or ramollissement of that portion of the Peritoneum connecting the Uterus with the Urinary Bladder occurred, followed by general Peritonitis and Death.* By JOHN RENTON, Esq. Surgeon.

THE history of the following case of child-labour, I consider, may be interesting to a certain class of the readers of the Edin. Med. and Surgical Journal. It is useful in a practical sense; and I trust, therefore, it may not be wholly uninstructive to those who are more immediately following the practice of midwifery, inasmuch as the appearances upon dissection illustrate, in a very strong point of view, the dangerous and fatal consequences which result from delay in delivery in cases of preternatural parturition.

Mr Monteith, surgeon, Penicuick, called early one morning, to ask my advice and assistance in a case, of which he gave me these particulars; that he had just been sent to a woman, who had been in child-labour for fifty or sixty hours; that he found upon examination the face presenting, and the chin turned towards the pubis, the pains quite gone, and the woman in a state of great exhaustion. I accompanied him to the case, and found the presentation as he described, the chin resting upon the pubes, and the forehead turned towards the sacrum. The head had scarcely entered the pelvis. The poor woman was much oppressed with sickness, and irritability of stomach; and her pulse was about 100. She was in her 34th year, and her previous labours had not been severe. From the want of sleep, and the long-continued and ineffectual action of the uterus, the depression of her spirits was commensurate with her bodily debility. She felt all her exertions had been hitherto fruitless, and her labour so very different from her four former accouchements, that she was very anxious to be delivered immediately with instruments. I endeavoured to excite the action of the uterus, which had either been suspended by laudanum administered, I understood, through the night; or, what is more likely, had been destroyed by the severity and duration of the labour; but I found that no expedient to which I had recourse was of any use. Neither moral nor medicinal means availed to renew or restore the lost vigour of the uterus. The encouragement usually derived from the presence of one, in whom the patient has confidence, had no sensible effect; neither had stimulants, as these only excited sickness and vomiting; and the woman, notwithstanding she was supported by two attendants, was unable in her weak state to bear the change, which I recommended, from the recumbent to the horizontal posture, a change which is often accompanied with very beneficial results. Though there was great prostration of strength, there was not that sinking, which (combined with the total and sudden cessation of labour-pains, as had occurred in this case, for some hours, before Mr Monteith was called in,) is peculiar to, and denotes, with other symptoms, the occurrence of rupture of the uterus. It did not appear, therefore, that the progress of labour was arrested by laceration of the uterine structure; the presentation not having receded, while there was not impaction of the head, and the patient never having experienced any of those sensations, during a pain, which writers describe, when the uterus gives way.

Considering all the circumstances of the case, that the uterus was, and had been long fully dilated, that its action, which had been severe and protracted, had now ceased, but had had little or no effect in forcing the head into the pelvis; that there was neither rigidity of the uterine structure, nor irritability in the patient's temper, to retard the descent of the child,—I could only account for the obstruction, on the supposition, that the woman might have a narrow pelvis, although she had borne several living children in a natural way, and that the inlet was too small to allow the preternatural presentation to pass.

After waiting nearly half an hour, and aware that long delay in such a state is dangerous to the mother, and that whatever practice is to be adopted is useful, in proportion as it is early resorted to, I considered myself justified in proposing to accomplish delivery, by diminishing the size of the head. In this opinion Mr Monteith concurred; and we were the more induced to adopt the easy and expeditious mode of effecting delivery, by embryotomy, in preference to the more painful and tedious one, by turning, not only that the mother had not lately been sensible of any motion, but much more so, because her strength was greatly exhausted, and that she had for some time experienced great tenderness and feeling of soreness over the abdomen, extending upwards from the pubic region, clearly indicating incipient disease in those parts. I ordered the attendants to make her bed comfortably up, and the wet cloths being removed from the patient, I put a broad bandage loosely round the abdomen,—a precaution I usually adopt, for the purpose of avoiding all unnecessary exertion after delivery, and especially in those cases in which hemorrhage may be expected. The urinary bladder had been previously emptied by the catheter.

Having placed the woman on her left side in bed, I gently introduced my left hand into the vagina, and gradually extended it upwards and backwards in the direction of the sacrum. I experienced no difficulty in returning the head above the superior strait with my fore-fingers, which I cautiously directed over the forehead; and in this part of the examination, I discovered that the dimension of the antero-posterior diameter of the brim was considerably diminished, by the protuberance, in the form of an enlarged ring, of the lowest lumbar vertebra. I kept my hand and fingers in this position for a short time, and then slowly moved the latter, within the posterior edge of the uterus, in the hope that mechanical irritation might excite uterine contraction, and that I might possibly be able to turn the head in the oblique diameter of the pelvis. Disappointed in this, I introduced the perforator, guiding it along the hollow of my hand, until it reached the anterior fontanelle between my fingers. I then requested Mr Monteith to compress the abdomen with both hands, while I opened the cranium. Having made a sufficient opening, I withdrew, with my right hand, the perforator, and introduced the crotchet, directing it, as I did the perforator, along my left hand. I readily fixed the instrument, and by means of it, turned the presentation in the long diameter of the brim. In imitation of natural pains, I pulled at intervals, and the crotchet never lost its hold. Keeping my hand in the vagina, and over the forehead, in order to protect the soft parts from a slip of the instrument, and withdrawing it, as the head advanced, I accomplished the extraction in less than half-an hour, without using much force, and without occasioning any apparent pain, or suffering, to the woman, as she never once complained. A large dose of laudanum, with brandy, was given; and by means of compression with the hand, on the uterine region, the placenta soon came away. A considerable degree of contraction followed; and over a strong compress, the bandage which previously had been applied, was tightened.

I have had occasion repeatedly to perform embryotomy, both in first labours, when impaction took place, accompanied with swelling and inflammation of the vagina, and in other cases, where there existed deformity of the pelvis, through which a living child could not pass, rendering sometimes the extraction both a tedious and difficult operation; but this was the only case I remember, in which the crotchet remained fixed, until the head was born, and where so little force was necessary to overcome the resisting obstruction, when unassisted by uterine action.

I remained an hour after delivery, and left the patient as well as could be looked for. The only symptom which appeared to be unfavourable was the sense of soreness and tenderness, which still continued in the lower and fore part of the belly, which, though soft, was distinctly enlarged in volume, the fulness indicating a tympanitic condition.

Although I occasionally saw the poor woman afterwards, Mr Monteith undertook the regular superintendence of the case, paying two or three visits a day; and from him I got the following particulars. The delivery was succeeded by a good night's rest. In the course of the following day, the pulse rose to 120, and the tenderness had very much increased in degree, and extended over the whole abdominal region, and was so much aggravated by pressure, as to render the removal of the bandage necessary. The belly at the same time became greatly tympanitic. General and topical blood-letting were employed, and carried, as far as the strength would permit, without affording much relief. Notwithstanding the use of hot fomentations, and of every other means usually had recourse to in peritoneal inflammation, which were both early resorted to, and assiduously persevered in, the disease run its course unmitigated, and the woman, who continued sensible to the last, sunk exactly six days after delivery.

In the history of the symptoms of this case, it would be improper to forget mentioning, that the lochial discharge, though scanty, continued natural, that the bowels were moved without much difficulty by gentle aperients, and that the urinary bladder regularly performed its functions.

The inspection of the body showed the following appearances.

The abdomen was much swelled. Upon opening it, the intestines were found greatly distended with flatus. The peritoneum was studded with patches of inflamed vessels, and thickly covered with coagulable lymph, which united the intestines. In the pelvic region there was a considerable quantity of sero-purulent fluid. The uterus was found with its fundus elevated about two inches above the brim of the pelvis, in size and shape resembling a pine-apple, soft and flabby. On raising it, the peritoneum, connecting it with the urinary bladder, was found lacerated about five inches in length, and in a state of mortification, involving the *os tincæ*, which presented itself imbedded in purulent and ichorous matter. The body of the uterus and its appendages were in other respects quite healthy, as were also the urinary bladder and rectum.

Through the kindness of the relations I was permitted to retain the uterus for a morbid preparation. Upon cutting into it, its internal surface was found perfectly free of disease, the morbid changes being entirely confined to that part of it connected with the sphacelated portion of peritoneum.

The child, a female, was considerably above the average size; but its head, though large, was not greatly ossified. It was quite obvious, however, that the progress of the labour could not be much facilitated by the compressibility of the head, as the delay was in the upper aperture; for, as Dr Denman justly observes, "Distortion of the pelvis at the superior aperture creates an obstruction to the passage of the head of the child, which will be overcome with more difficulty by the powers of the constitution, and which will be more inconveniently managed by art, than an equal degree of obstruction in the lower part of the pelvis. The greatness of the difficulty will nevertheless chiefly depend upon the degree; and in the various degrees which are found to occur, every person must see an evident cause for all the kinds of difficulty which he may meet with in practice. A small degree of distortion, like an originally small pelvis, may occasion a difficult labour of that kind, which may not be an object proper for the exercise of his art, as it will at length be completed by the long-continued action of the uterus, first moulding and reducing the form and size of the head, till it is adapted to that of the pelvis, and then forcing it through the diminished cavity; or the degree of distortion may be such, that, notwithstanding all the moulding and reduction of the head, which can be accomplished by time and the efforts of the constitution, there does not exist sufficient room for the passage of the head through the pelvis; but it may, nevertheless, be at length brought into such a situation as to afford us the hope of safely delivering the patient, by the use either of the forceps or vectis, and of preserving the life of the child; or the distortion may be so considerable, that it is impossible for the head of the child to be expelled without lessening it, and the child, if living, must be sacrificed to the safety of the parent." *

Although the different degrees of distortion which Dr Denman has enumerated as causes of obstruction to the passage of the child, especially in the upper aperture, may be supposed to refer to natural labours, it is easy to understand how much the difficulty of the descent will be increased in preternatural cases, in which, along with the impediments arising from diminished capa-

---

* Dr Denman's Introduction to the Practice of Midwifery, p. 245, 7th edition, 1832.

city of the pelvis, and the presentation of the long diameter of the head, there are combined those other causes of delay which occur when the uterus is affected with cramps or spasmodic pains, and is unable to exert its force, or, if I may so express it, to unfold its power properly, when the head of the child is long retained in the position described in this case, or when it becomes inert from long-continued exertion. The ergot of rye, I understood, had been tried early in the morning without advantage; and when the poor woman's stomach had become so irritable as to be unable to retain it, I deemed myself warranted, in her exhausted state, in sacrificing the child to the safety of the parent, not on the ground, that the distortion was so great as to render it impossible for the head to be expelled without lessening it; but because I considered the time to trust to renewed efforts of the constitution was now expired, and that the mischief already done to the soft parts by long pressure, demanded immediate delivery. "Pressure," says Dr Ryan, * "causes congestion, and slow inflammation of the soft parts, which generally terminate in sloughing after delivery, or may extend to the uterus or peritoneum, and cause death."

There is no difficulty in explaining the cause of death, and in accounting for the sloughy condition of the peritoneum, which has been described; for it is unquestionable that the injury done to that part before delivery occasioned the peritonitis which followed. No doubt, indeed, can be entertained that the attack arose from local, and not from constitutional derangement, although we had been deprived of the evidence afforded by a *post mortem* examination, when we look to the symptoms which preceded, and which immediately succeeded delivery, especially to the pinching and tender pain felt in the pubic region, and to the tympanitic condition of the abdomen, when the bandage was applied. Every practical accoucheur knows, that, in those protracted and laborious cases, in which the patients complain of severe lancinating pain behind the *symphysis pubis*, during the progress of the labour, either the laceration of the womb has been found to be there situated; or that extensive inflammation, or morbid structural changes, have been established.

The woman was a very healthy person, of temperate habits, not of an inflammatory constitution, and patiently and submissively bore her protracted labour, although she knew from her previous confinements, that her pains not only did no good for a long time, but that the action of the uterus seemed to be inverted, (which it often is) after the sharp pain in the pubic region supervened till labour finally went off.

---

* Vide Ryan's Manual of Midwifery, 3d ed. 1831, p. 543.

Dr Burns has very properly remarked, "If the forceps be injudiciously introduced, the bladder or uterus may be perforated; or if the head be allowed to remain too long jammed in the pelvis, some of the soft parts may slough."—Vide Principles of Midwifery. By John Burns, M. D. 8th ed. 1832, p. 452.

I can attest the truth and justness of these remarks of Dr Burns, by many a melancholy case, to which I have been called, in which I have witnessed the fearful havoc, made by the rash and forcible employment of instruments, upon the textures of the vagina, uterus, rectum, peritoneum, and bladder; where life has been protracted under sufferings, which it is impossible to describe,—sufferings which art cannot even palliate, and death only could have removed; and the present case is one of many others to testify as to the injury done to the soft parts by compression.

It appears to me, that the long-continued pressure of the chin upon the soft parts satisfactorily accounts for their sloughed condition; and that the loss of continuity might be more dependent upon the ramollissement produced by such a cause, than that the breach of texture was effected by a violent injury producing inflammation, which was succeeded by sphacelus, especially when we have no direct evidence of the forceps having been previously used.

The value, however, of the practical precepts which this case inculcates is not diminished, whether we view it in reference to the danger which arises from want of caution in the application of instruments; or to the necessity of employing those remedial means, in preternatural labours, which are only useful, when they are early adopted—before inflammation has supervened, (which it not unfrequently does before delivery,) and before those structural changes have been produced by delay, which terminate afterwards in local mortification, and death.

Penicuick, October 18, 1837.

Art. VIII.—*Account of a remarkable Case of Suicide, with observations on the fatal issue of the rapid introduction of air in large quantity into the circulation during surgical operations.* By P. D. Handyside, M. D., F. R. S. E., Lecturer on Anatomy. (With Sketches of the superficial incisions.)

On Saturday, February 18th, 1837, at half-past ten A. M., I was called to afford assistance in the case of Mr John Doherty, aged 36, who was then resident in Edinburgh during the first year of his medical studies, and who had a few minutes before met with his death from severe wounds in the neck made with a razor. I saw the body of Mr D. ten minutes after the incisions which had caused death had been made. It lay fully clothed and extended upon the floor of the bedroom; with the head towards the door. The fore-part of the body, and the back of the hands were in contact with the floor, and the razor stained with blood lay at the distance of about two inches from the open right hand. Respiration had ceased, and the pulsation of the heart and arteries was gone. There was no hemorrhage, scarcely indeed any oozing of blood, and not above one pound and a half of this fluid, and that for the most part venous, had escaped from the divided vessels. This blood lay, partially coagulated, upon three different parts of the floor of the apartment.

I immediately resorted to some of the usual methods employed for effecting recovery from asphyxia, caused by the entrance of air into the heart, but without any success.

I then examined the condition of two irregular incisions which I found upon the neck. The wound upon the left side was the smaller, and appeared from various circumstances to have been the first which was made. It extended obliquely downwards from the lobe of the ear, towards the junction of the body with the left cornua of the *os hyoides*, measured two inches and a half in length, and the angle of the jaw was one inch above the middle of it, and it appeared from its direction to have been inflicted with the instrument held in the left hand of the individual. (Plate III. Fig. 1.) The incision upon the right side of the neck was the larger, being four inches in length, and in making which one superficial and two deep wounds had evidently been inflicted, and, if not by another person, with the right hand of the deceased himself, as was evident from the appearance of the edges of the incision. Its middle part corresponded likewise to the angle of the jaw, though placed half an inch beneath it. It may be added, that in making this very irregular incision, a slight wound had also been inflicted on the skin over the angle of the jaw. (Plate III. Fig. 2.)

Although I ascertained upon inquiry that Mr D. had been ambidexter, still, from the unusual position of the wounds and other circumstances peculiar to this case, I requested the valuable advice of Dr Christison, who concurred with me in opinion that the case should be judicially examined. I accordingly obtained a warrant for making an anatomical inspection of the body in order to discover the cause of death, which I undertook with the assistance of Mr Hutcheson, surgeon, Dr Houseman, Mr Atkin, and others, provided with means for performing with accuracy those experiments on the state of the blood-vessels which, in the event of finding no cause of death apart from the entrance of air into the divided vessels, seemed to me desirable, in order to be enabled to pronounce satisfactorily upon the subject.

Sectio.—The body was examined twenty-six hours after death, an interval during which the weather had been extremely dry and cold, and the body retained in an apartment equally so; and there was not the slightest trace of putrefaction apparent.

The integuments surrounding and implicated in the wounds were carefully removed and preserved, in order to exhibit the form of the incisions, which were next faithfully transferred to a plaster cast of the neck and head.

It was then found that on the *left* side the *platysma myoides*, to the breadth of two inches and a half, the anterior two-thirds of the *sterno-mastoid* with the trunk of the *spinal accessory* nerve, and the lower margin of the *parotid gland*, had been freely divided. Of the parts beneath, the conjoined origin of the *occipital* and *posterior auris* arteries, with the *posterior facial* vein, were found cut across; and through the latter of these vessels several globules of atmospheric air were found to have entered the *internal jugular* vein.

The incision on the *right* side, which was much deeper, and made evidently by three separate strokes of the cutting instrument, was found to have laid freely bare the *transverse process of the atlas*, and to have opened up the space which intervenes between it and the transverse process of the *axis*, sufficiently to expose to view the *vertebral artery*. The following parts were discovered to have been also freely divided;—the *platysma myoides* to the breadth of four inches, the *sterno-mastoid* with the trunk of the *spinal accessory* nerve, the *external and internal jugular* veins, the *superficial cervical and auricular branches* of the third cervical nerve, the *anterior and posterior facial* veins, with the inferior border of the *parotid gland*, and the posterior margin of the *submaxillary gland;* the *digastric and stylo-hyoid* muscles, the *levator anguli scapulæ*, the anterior margin of the *splenius capitis*, and highest insertion of the *splenius colli* muscles; the *pneumogastric*, and anterior branches of the *descendens noni* nerves, and the *posterior auris* artery. The *facial* artery near its origin was found to have been opened slightly.

On examining with great care the contents of the blood-vessels, I ascertained that the *internal jugular* veins, though empty of blood, were slightly distended with air. The arteries of the neck generally, were empty, with the exception of the left carotid, which contained a considerable quantity of air. The *middle* and the *inferior thyroideal* veins, and, on opening the *thorax*, the *venæ anonymæ*, the *descending vena cava* and the *vena azygos* were found partially distended with air, besides containing a little fluid blood.

On opening the *pericardium*, the cavities of the heart were found collapsed, and nearly empty. The *right auricle* was perfectly empty of blood, with the exception of a minute coagulum at the *foramen ovale*, which (as I have had occasion to observe in the average of one out of every eight cases in the adult) was patulous. This cavity contained some atmospheric air. The *ascending vena cava* contained a little uncoagulated blood, and air. The *coronary* veins and *right ventricle* were empty of blood, but contained air. The *pulmonary artery* and its minute ramifications contained a very little frothy blood, quite insufficient to separate their walls, which were collapsed; while again, the *pulmonary veins*, from their commencement to the left auricle, were in a state of distension on the left side, and in a state of partial distension on the right, from a commixture of dark-coloured blood in a fluid state, and atmospheric air. The substance of the *lungs* was distinctly emphysematous. The left *cavities* of the heart were found perfectly empty of blood, but in a state of partial distension like the other cavities of this organ, from the presence of air. The *coronary arteries* were empty of blood, but contained globules of air. The texture of the heart was paler in colour than natural.

On opening the *abdomen* I found the *vena cava* and the larger venous trunks to a greater or less degree distended with air, and containing very little blood, and that in a fluid state. On cutting into the *liver* under the surface of water, after a manner similar to that followed in all the preceding and subsequent experiments, air was observed to escape from the *hepatic veins*; and on treating the *spleen* and *kidney* in a similar way, like results were obtained. The *pancreas*, and the *coronary veins* of the stomach presented also the same results. The abdomiual *aorta*, on being carefully insulated for three inches in extent by ligatures applied above and below, and also to its branches, and then placed under the surface of water, gave vent on being opened to several globules of air.

The *femoral* and *popliteal* and the *brachial* arteries, upon being similarly treated were observed to contain air.

All the *viscera* of the *thorax* and *abdomen*, with the exception of a few slight adhesions observed between the *pleura* of the lung and that covering the *pericardium*, and some patches of coagulable lymph, not recently effused, found over the right side of the heart, were perfectly healthy. The liver, *pancreas*, spleen, and stomach, were paler in colour than natural; the stomach was empty, and the gall-bladder was distended with bile.

The *muscles*, with the exception already given, were natural both in colour and texture.

That the air found in the blood-vessels in the foregoing case was not effused as a result of the putrefactive process, appears, not only from the circumstance of the shortness of the interval and other circumstances that elapsed from the death of the individual to the examination of the body, but from the consideration also, of that air having been found commixed after a frothy manner with the blood in the vessels, an appearance which is not compatible with simple decomposition, though the converse of this, (the air and blood remaining wholly unmixed after violent death) has been occasionally observed.

Having remarked in turning over the records of cases bearing on the subject of the present communication,* the very scanty and unsatisfactory amount of the details of the necroscopic appearances which the narrative of almost all of these cases presents,† I have been induced to communicate an account of the appearances observed, and the results of some careful experiments on the state of the blood-vessels made, in the present instance, soon after death. And I shall now subjoin, as suggested by the consideration of this and other cases, such remarks as appear to be fair deductions from the data we now possess, in connection with a subject, the entry of air into the veins, which, whether considered in reference to its bearings on practical surgery, or in relation to suicide, to physiological or to pathological investigation, may be regarded, certainly, as one of unusual interest.

The Cause or Causes of the entrance of Air.—In instituting an inquiry into the mode in which air may, during a surgical operation, or in a case resembling the present, enter a divided blood-vessel, I would submit the following observations.

The admission of air must depend, *first*, upon the patulous state of the wounded vessel being maintained, which in the case of a vein is,—in consequence of the want of rigidity in its coats, and hence its great tendency to collapse,—effected either by the adhesion of its thin and pliant walls to the contiguous tenser textures, as is observed to take place in certain positions of parts of the body, or by its being kept from collapsing, by its situation in respect to larger veins, for example, one of the *thyroid* veins entering transversely the *internal jugular*;—or again, by its being adherent to or imbedded in the texture of a firm tumour,—conditions which severally thus afford a strong amount of tension and support to the opened vessel. And, *secondly*, the active requisites for the entrance of air into either arteries or veins appear to be the inhaling power of these vessels, which in the case of arteries consists in the maintenance of the pulsatory and accelerating movement, which is conducive to the progress of the blood or air on which their walls react,—and in the case of veins, the inhaling or traction power of the heart, and the resilience of the lungs. Both of these conditions are produced by the dilatation of the walls of the chest consequent upon each inspiration; and as an additional influence available in determining the flow of blood or entry of air into the heart, may be added the elasticity, or a certain amount of physical *reaction*, (the *derivation of Haller*,) exerted by that organ during its diastole. *

---

* For an able analysis of these cases, which supplies the place of any historical summary that I might have offered here, I beg to refer to the American Cyclop. of Pract. Med. and Surg. Part iii. p. 263, Philadelphia, January 1834, Art. Air, by Dr Warren of Harvard University, as well as to the recent work by the same author, "Surg. Obs. on Tumours," p. 259—301; to some valuable editorial remarks on these cases in the 48th Vol. of this Journal, p. 554, and to Dr Cormack's Prize Thesis, p. 21, Edinburgh, 1837. Dr. Cormack has contributed to our knowledge of this subject by giving the details of several additional experiments which he performed on the lower animals.

† As exceptions, I may mention the case of M. Beauchene, which occurred in the Hôpital St Antoine, Paris, in 1818, and some of the details of which are given in Magendie's Journ. de Physiol. Tom. i. p. 192, and Dupuytren's case narrated in the Archiv. Gen. de Méd. Tom. v. p. 430. Paris, 1824.

The traction power which, to a limited extent, the heart and chest are during ordinary inspiration capable of exerting over the motion of the blood in the venous trunks, has been not only much overrated by recent authors, but has been erroneously regarded as an active suction power, and a property of active dilatation. Admitting the existence of this power, its greatest amount during natural inspiration was found by Hales to be too limited to raise a fluid even one inch through any kind of tube, and in large animals, as the horse, to the height of six inches only. During convulsed, disturbed, or laborious breathing, however, or that performed by all the accessory agents of respiration, this power is so much increased as to be equal to that of raising a column of blood exceeding twelve inches in height. (Arnott's Physics, p. 573. London, 1833.) It is manifest that the condition of respiration now specified would operate most efficiently during severe surgical operations, or in the wounds occasionally inflicted in the throat, either with the intention of homicide or suicide; and that therefore we have a cause fully adequate to produce the entry of the large volume of air, the presence of which proves fatal in such cases as the present.

Another reason besides that which I have assigned for the vessels remaining patulous when divided, has been sought for in that morbid condition occasionally found, viz. a state of rigidity, or a preternaturally thickened state in the coats of the veins. But in a very large proportion of cases that have occurred no such condition has been found. It cannot, indeed, be denied, that when the veins are in an enlarged and indurated state, their coats when cut must be prevented from collapsing, and so evidently favour much the entry of air; but in the conclusion I have arrived at, I am supported, I find, by the authority of Berard (Archiv. Gén. de Med. Tome xxiii. p. 172,) in ascribing "the phenomena chiefly to the anatomical peculiarities of the vessels, independent of disease."

In the case before us, it would appear that, owing to the complete division of the coats of many large veins in the neck, and to the consequent intimate adhesion of their thin walls to the dense sheath of the cervical vessels, and the attachment of that

---

* See Bostock's Physiology, 1828, Vol. i. pp. 412, 413.

sheath to the tense *deep cervical fascia*, assisted by the state of full extension of the head and limbs, these vessels were kept in a constrained and patulous state; and thus we may see, from the observations already made, how air, exclusively of blood, would pass along them into the heart with such rapidity and force, as to cause immediate death. That death is dependent in a considerable degree on *force* being in operation at the time, is proved, both from the narratives of many surgical cases on record, where the *rapid* entrance of even a small quantity of air proved immediately fatal, and from the early experiments of Harderus and others[*] and the more recent experiments of Nysten,[†] Brettonneau, Magendie,[‡] Dupuytren,[§] Wing,[‖] and Dr Cormack.[¶] From these experiments it appears, that when great *force* is used in blowing, death takes place with the greatest conceivable rapidity, and in such cases similar appearances to those found in the case before us,—particularly the appearance of a little frothy blood in the pulmonary artery,—presented themselves; while in other instances, where no great force in the introduction of a limited quantity of air was had recourse to, the animals operated on recovered.

It further appears, that, in order that the air admitted should exercise a fatal effect, it should enter *in large quantity.*[**] It is established from the observations of Dupuytren,[††] and of those practitioners who have been in the habit, in cases of cholera, &c. of practising the introduction of saline injections into the veins, as well as from the direct experiments of Camerarius and others,[‡‡] of Nysten,[§§] Magendie,[‖‖] Blundell,[¶¶] Wing,[***] Dr Cormack,[†††] and others, that when the quantity of air is small, it makes the round of the circulation, as appears from its being in such cases found after the lapse of a short time in every minute artery and vein throughout the body, and after a longer interval is found to have wholly disappeared, either by the process of absorption,[*] or become so intimately commixed with the blood, as to be rendered incapable of causing any impediment to the circulation.

---

[*] Morgagni de Sed. et Caus. Morb. Epist. v. Sect. 21.

[†] P. H. Nysten, Rech. de Physiol. et de Chimie Pathol. Paris, 1811. Sect. 1. Art. 1. Exp. iv.

[‡] Journ. de Physiol. Expér. Tom. i. p. 191.

[§] Archives Gén. de Med. Tom. v. p. 436.

[‖] "Boston Med. and Surg. Jour., as quoted in the Lançette Française, Mars et Mai 1835."

[¶] Prize Thesis, Edin. 1837, pp. 13, 25.

[**] And not to the amount of a single bubble only, which quantity, Bichat asserts, if introduced into a vein, occasions immediate death. See Recherches Physiol. sur la Vie et la Mort, Paris, 1800, pp. 268, et seq. 4th edit. by Magendie, Paris, 1822.

[††] Archiv. Gén. de Med. v. 436. Paris, 1824.

[‡‡] Morgagni, Epist. v. Sect. 21.

[§§] Nysten, op. cit. p. 26.

[‖‖] Magendie, op. cit. pp. 194, 198.

[¶¶] Experiments on the Injection of Air into the Veins, Lond. Med. Chir. Trans. ix. 90; and Appendix to Ashwell's Treatise on Parturition. London, 1828.

[***] Op. jam cit.

[†††] Op. cit. p. 26, et seq.

Symptoms.—The symptoms which immediately supervene upon the admission of air into the blood-vessels, announce that the amount of blood circulating in the encephalon is very suddenly diminished. For, first of all, when the quantity of air admitted is small, then syncope only and the symptoms of diminished natural flow of blood to the head are apparent, and that too in less than a minute's time. The individual experiences faintness, and other symptoms of uneasiness; his face becomes pale, and his eyes are fixed; next, he cannot distinguish objects, his head falls back, and he loses sensibility; his breathing becomes heavy and difficult, and the movements of the chest are feeble; and he is seized with general trembling, and his whole body is covered with a cold sweat. The contractions of the heart are at first hurried; the organ beats violently and irregularly; its action next becomes feeble and fluttering, and the pulse extremely small and weak, very quick, hard, and irregular. At this crisis the unassisted powers of nature may prevail, the heart regaining strength to propel the volume of air; or by the aid of stimulants and restoratives, by bleeding and artificial respiration, employed at the proper juncture, the functions of the system may, as in ordinary syncope, be restored.

In the second place, when restorative measures are of no avail, and the heart does not recover its action, or the air is admitted into that organ in large quantity, and has entered it with rapidity and force, then, after the appearance of some or all of the symptoms of oppression now mentioned, the respiration becomes laboured and stertorous; some violent efforts at inspiration are made; the body and limbs are strongly convulsed; in a few seconds more these violent convulsions are observed to recur; and, without the loss of more blood, often attended with the loss of less, than is drawn at an ordinary venesection, death closes the scene.

Theory.—In tracing the *modus operandi* of the presence of air in the veins producing the foregoing train of symptoms and effects, although I may premise that we know with certainty but little, yet we are justified in assenting to the well-founded general belief, strongly maintained by Nysten [†] and Magendie, [‡] and supported by the late Sir John Leslie, that when the cavities of the heart become suddenly and violently distended with air, this organ cannot freely exercise its functions, but encounters much difficulty in contracting on such a powerful and elastic resistance. It cannot, however, be granted, that death is produced by the heart being prevented from propelling the blood which it contains, into the lungs, as Nysten argues; for both the blood and the air, we have seen, are propelled, and in cases where, from the quantity of air that has entered, a fatal result has ensued, not only has the heart been found empty, but the pulmonary vessels and the arteries of the system have at all parts contained air.

---

[*] Dr Christison, in the 35th volume of this Journal, pp. 98, 99, 102, 103.

[†] Op. cit. p. 27. [‡] Ibid. cit. p. 191.

In the next place, death cannot result from another alleged cause; viz. the loss of contractile power, or irritability in the heart, consequent on an over-distension of its walls, or as the result of the fatigue and exhaustion which this organ endures in its repeated powerful efforts to expel the successive large quantities of air which it receives. For although analogy shows, and dissection proves, by the pale colour which the heart exhibits, and by the coronary arteries and veins containing air only, that this agent operates most powerfully, yet this appears to be an insufficient reason in accounting for the instantaneously overpowering and often fatal effects which succeed the entrance of the air into the venous system. In proof of the correctness of this conclusion, I remark, that we are in the habit of observing, in cases similar to that of the Honourable Colonel Townsend, detailed by Dr Cheyne, as well as in cases of resuscitation after the body of an individual has been five minutes or even three quarters of an hour under water,[*] and in experiments on animals, that the contractions of the heart may be with impunity suspended[†] for a longer interval than often precedes death from the entrance of the air. An interesting and important fact ascertained by Drs Cormack and T. R. Scott,[‡] may likewise be adduced as proof against the common idea regarding the stoppage to the heart's action which follows the entrance of air into the veins, being occasioned by a loss of its contractile power from overaction. This is, that "in a horse about seventeen hands high, and in pretty good condition, where death occurred in three minutes from the commencement of the introduction of air into the left jugular vein, (and which introduction of air lasted one minute,) the contractions of the heart continued very forcible long after it had been cut out of the body."

But it might probably be urged with greater propriety by those who seek to realize the old maxim, "cor, primum vivens, ultimum moriens," that the complete stoppage of the sanguiferous supply to the texture of the heart along the coronary arteries, is the real cause of death, seeing that Sir A. Cooper's recent experiments go to prove that the withdrawal even for a minute and a half of the supply of blood to the *mesocephalon*, and the spinal marrow above the origin of the *phrenic* nerve, by compression of the *vertebral* and *carotid* arteries, is fatal. The notion must be allowed to be fair and reasonable, that the function of the heart may be similarly arrested, by the withdrawal, differently effected, of the sanguiferous supply to its texture. Such is indeed the effect which we may be prepared most fully to expect to follow immediately upon the stoppage of the circulation in the primary muscular fibres of this organ, arrested as that supply of blood through the coronary arteries would almost momentarily be, by the failure of the usual current of blood from the lungs and left ventricle, and by the gaseous substitute for it which would then be forced through the aortal aperture. Yet, being aware that this temporary failure of the circulation is not adequate to explain the circumstance of the rapidity of death being always in the exact ratio of the *suddenness* and *violence* with which the heart is distended with air, (as the considerations already offered respecting the suspension of the heart's action may have served to shew,) we are constrained to look more narrowly into the probable cause of death, and inquire, if, in such a case, the encephalon and spinal cord receive any supply of blood at all; and now finding that impossible, and next comparing the phenomena which supervene on the admission of air,* with those symptoms and results which characterize several anormal states, wherein a similar derivation of blood from the head occurs, we accordingly at once recognize the analogy, and may thence be led to adopt as, at least, probable, such a view of the cause of death as follows.

---

[*] Détail des succès de l'etablissement que la Ville de Paris a faite en faveur des personnes noyées. Paris, 1773, quoted by Dr Good. See also the Reports of the Royal Humane Society.

[†] See Dr Goodwyn on "the Connexion of Life with Respiration." London, 1788, Pp. 82, 83.

[‡] Op. cit. pp. 10, 12.

The cessation of the heart's action must operate injuriously, first, on the maintenance of the function in those organs which require an unceasing and unintermitted supply of blood. As the encephalon receives about one-eighth of the blood of the entire body, the prejudicial effects of a very slight want of balance in the proper amount of which, are so frequently presented to our view in the phenomenon of syncope, and as the encephalon, and that part of the spinal cord, so essential to circulation and respiration, above the origin of the phrenic nerve, are supplied with blood almost exclusively, along the vertebral and carotid arteries; it is easy to understand how these parts of the nervous system are, by the distension of their vessels with an elastic fluid, wholly deprived of their supply of blood. And if the heart's action at the same time be not maintained sufficiently long, first, to circulate all the air it contains, and then to recommence the discharge of its appropriate fluid,—a result equivalent to the complete division by the knife, of that essential part of the nervous system must follow,—namely, the instantaneous cessation of all the automatic movements of the system. †

---

* All the phenomena, before described, exhibit very sure proofs that the amount of blood circulating in the encephalon and higher cervical region of the spinal cord is very suddenly diminished. The violent convulsions particularly which have been observed always to precede death, imply a condition which obviously follows the sudden diminution of the supply of blood to the brain, in whatever manner that sudden diminution be effected.—See also Abercrombie on the Brain and Spinal Cord, 1828, p. 312.

† Bichat indeed produced immediate results and *post mortem* appearances in animals similar to those arising from the accident under consideration, by propel-

This view seems the more probable, from considering the interesting experiments already adverted to, and which I had recently the favour of witnessing Sir A. Cooper perform. In all these experiments the manual compression for the period of a minute and a-half of the vertebral and carotid arteries in rabbits was followed by death, preceded always by violent convulsions, similar exactly to those which have been observed to occur on depriving the parts of the cerebro-spinal axis, on which these vessels ramify, of their supply of blood, through means of the admission of air, either casually on the operating table, or intentionally in experiments on animals.

Finally, then, the phenomena which have been detailed, and the remarks made, afford proof, that, although the heart is the organ primarily and directly affected, the encephalon and its adjacent portion of the spinal cord, are the parts ultimately and indirectly influenced, and being arrested in their presiding functions, thus produce the fatal result.

Concluding Remarks.—The foregoing case of suicide is interesting and valuable, in a variety of points of view deserving of brief notice here, both in its medico-legal bearings, and as compared with other instances of death from the entrance of air into the circulation.

1. It differs little from cases of suicide generally, in which, according to Osiander[*] and other writers, the weapon is always dropped from the hand before death.

2. It differs from cases of cut-throat, generally, in the circumstance, *first*, that more than one incision were made, and *secondly*, that both hands were employed for this purpose. The latter circumstance seemed more than probable, from regarding attentively the appearance of the edges of the wounds, since the peculiarity of direction and depth in an incision, made in this way, bears always a corresponding relation to the hand which has been used in inflicting it. But, if taken in connexion with two other cases on record, one detailed by Osiander,[†] and parallel in both particulars, just specified, to that under notice, the other narrated by Dr Gairdner[‡] and corresponding to the present case in respect of several incisions having been made, we shall be guarded against forming erroneous deductions as to any other case which may present such peculiarities, not being a case of suicide.

3. The preceding observation explains satisfactorily, what in the practical examination of similar cases to those adverted to, calls usually from medical practitioners for especial regard; viz. the extreme *irregularity of form* in the incisions, a condition which

---

ling air upon the brain through one of the carotid arteries. (Op. cit. p. 270.) Again, cases of sudden death are mentioned by Morgagni, (Op. cit. § 19, § 24.) and other authors who have written on gaseous apoplexy, in which air was found in the vessels of the brain.

[*] F. B. Osiander, über den Selbstmord, Hannover, 1813. s. 156.

[†] Op. et loc. cit.

[‡] Case of Attempt at Suicide, in the xvi. Volume of this Journal, p. 353.

has been, by Sir Everard Home,[*] regarded as a presumption always against suicide.[†] For we now see how, if a body be discovered on a road or in a retired spot, under circumstances leading to the apprehension of some suspected individual, and the marks usually assumed as those of suicide be found wanting on it, while others of a quite opposite character present themselves, medical testimony may (in ignorance of the facts alluded to) give countenance and support,—and that too, far wide of the truth,—towards establishing the validity of the charge which may be presented against the individual, solely on collateral and indirect evidence. And thus farther proof is afforded of a fact which criminal law so often serves to display, how an inadequate amount of knowledge,—like an insufficient *post mortem* inspection,—may render, in the progress of a serious trial, the results of the examination of medical witnesses matter of such momentous importance.

4. The uncommon situation of the wounds in this case is explicable on the circumstance of the partial acquaintance of the individual with the anatomy of the neck.

5. The unusual amount of important parts here divided, in wounds limited superficially, but made after repeated introductions of the cutting instrument,—is perhaps worthy of remark.

6. The circumstance, that notwithstanding the very deep and extensive incisions made with the view of opening the carotid artery, the anatomical relations of that vessel are such, that it alone, of all the contents of the cervical sheath of vessels, escaped injury, is probably an unique occurrence.

7. The heart, as in M. Beauchene's case, was perfectly empty of blood, and contained air alone; other cases of death from this accident having usually presented in this organ, commixed with the air, some blood, either in a fluid,[‡] or else in a frothy state. The lungs, as in Beauchene's, Dupuytren's[§] and a few other cases on record, were emphysematous,—a condition not ascribable apparently to any degree of violence in the employment of artificial respiration in this, or probably, in any case, excepting in that of M. Roux.[‖] There was no injection of the capillaries of the stomach, or other organs; on the contrary, these were found, as already stated, paler in colour than natural.

---

[*] Dr Gordon Smith's For. Med. 1824, p. 305.

[†] I have given, (Plate III. Fig. 3.) from a subject brought this season into my Practical Anatomy Rooms, a comparative sketch of the *regularity of form* of a wound inflicted by another person, and which caused death in a few minutes. A woman plunged into the left side of the neck of her husband, in a direction downwards and forwards, between the angle of the jaw, and the anterior margin of the *sterno-mastoid* muscle, one of the pointed straight knives used for cutting leather. She thereby divided the posterior two-thirds of the internal carotid artery, the anterior part of the internal jugular vein, and the pneumogastric nerve. The incision in the skin was only three-fourths of an inch in length; its long axis lay in a transverse direction, and its edges were perfectly smooth and regular. In this case the state of the veins was not ascertained.

[‡] Dupuytren, Archiv. Gén. v. 433.

[§] Ibid.

[‖] Journ. Univ. et Hebdom. xi. 165. Paris, 1833.

8. The rigidity of the muscles was complete in this case one hour and a-half after death. This circumstance may probably appear worthy of mention, since, although the period of the approach of the rigidity of the body is observed to differ in different individuals, yet the opinion has been advanced by our first medical jurists, that "the rigidity of the muscles does not generally come on for some hours after death," * and "it has been laid down as a general rule, that the more sudden the death, the longer is cadaveric stiffness from taking place, and that this rigidity occurs only after the vital heat of the body is gone." † But in the present instance the case was otherwise, the vital heat of the body having been evident to the senses after the commencement of the rigidity. In connexion with which fact may be mentioned, the opinion of Professor Louis, ‡ who says, "it commences at the moment of death, even before the diminution of the natural heat;" and the evidence of Professor Traill, § that he has "known rigidity begin before death takes place, and it sometimes takes place immediately, and differently in different individuals and diseases."

Edin. 10, *Shandwick Place, Nov.* 20, 1837.

Appendix to the Paper of Mr Laycock on Hysterical Ischuria.

V.—*Fifth Series.*

Jane Snellgrove, aged 19, fair complexion, and having a frame of elegant symmetry, was admitted into the Westminster Hospital, under the care of Dr Bright. She had symptoms of cerebral irritation, aphonia, very frequent respiration, acute and variable pain in the thorax, loins, and abdomen, and tenderness of the latter region. The pulse was 140, the bowels were sluggish, the urine limpid, and required to be drawn off by the catheter. Three years previously the catamenia appeared once, and never again. At this time the above symptoms commenced. Once or twice a-week she vomited a fluid of a dark-brown colour, having a strong urinous odour, and containing a little albumen and a large quantity of urea. She left the hospital unrelieved. No imposition could be detected.—Lancet, Vol. ii. of 1832–3, p. 704.

A young woman, aged 24, subject to nervous affections when 21, was bled by mistake to four pounds. Paraplegia came on, and, subsequently, after great mental emotion, a spasmodic affection and retention of urine for fourteen days, during which time this fluid was discharged from the stomach, nipples of both breasts, umbilicus, and skin of the legs, in succession, accompanied with pyrexia and various local symptoms. After the urine was restored to its normal channel she had hemorrhages from the mammæ and umbilicus, and various strange symptoms.—Med. Gazette, Sept. 9, 1837.

---

* Evidence of Professor Christison in the Report of the Trial of Robert Reid for murder, published by authority, Edin. 1835, pp. 24, 26.

† Paris and Fonblanque's Med. Jurisp. Vol. iii. p. 24. ‡ Lettre iv.

§ Report of the Trial of Robert Reid, published by authority, pp. 27, 28.

PART II.

CRITICAL ANALYSIS.

ART. I.—*Mémoires de l'Académie Royale de Medecine*, Tome v. 4to. Pp. 634. Paris, 1836.

THE present volume commences with an eulogium on M. Chaussier, who first practised with distinction as a physician at Dijon, where he was born in the year 1746, and afterwards at Paris, where he died in the year 1828. He was physician to the Polytechnic School, and to the Hospice de la Maternité; and wrote many useful memoirs and works, principally relating to various branches of Medical Jurisprudence. A discourse is also mentioned as having been delivered by M. Pariset, on the interment of M. le Docteur Bordois de La Motte.

This gentleman was born in the year 1754, at Joigny, in the department of Yonne. He studied in Paris, and became physician to the Charité, where the foundations of his fortune, singular as it may appear, were laid, by the fame acquired by him in *curing himself* of a severe disease of the chest, when his life was despaired of. He was employed by various branches of the Royal Family; and though he suffered during the Revolution, being at that time thrown into prison, he was soon liberated, for the purpose of being sent into Italy on the public service. From this time, his career of success and reputation was regular and advancing. He was in the confidence of Napoleon, and afterwards attended Louis XVIII. and Charles X.

The volume likewise contains an eulogium on *M. Dupuytren*, and *M. Lerminier*, both of them by M. Pariset.

M. Dupuytren was born in the year 1777, at Pierre Buffière, a small town in Haut-Vienne, in France, and, like Adam Smith, who was carried off from his home by some gipsies, but was pursued, and brought back, he was stolen by a rich female of Toulouse, who was in want of a child, and was soon recovered by his father.

In the year 1789, being then at the age of 12, he was induced, by his own inclination, and the permission of his friends, to accompany a cavalry officer to Paris, who placed him with his brother, who was at the head of the College of la Marche. Here he continued till the year 1794, and having devoted himself to the study of anatomy, though under great privations from the narrowness of his circumstances. he was appointed, after a concours, to the situation of assistant dissector at the School of Medicine of Paris. Fragonard being at the head of the department, Dumeril succeeded the latter by one vote, in the year 1801, but, being in a few months afterwards elected a professor, Dupuytren succeeded him. In 1803, he received, by concours, the appointment of surgeon de seconde classe to the Hotel Dieu; and in 1808, was made conjoint surgeon in chief.

On the death of Sabatier in 1811, the chair of operative surgery became vacant, and Dupuytren was elected to it, after a concours of no less than forty days, during which the utmost anxiety existed as to the result of the contest. On one occasion, indeed, during its continuance, a thesis, which it was necessary to prepare by a given time, was not ready, for Dupuytren did not compose rapidly; but the difficulty was surmounted by a slight *ruse de guerre* on the part of his friends. He was now at the height of professional eminence, in which he continued till his death, which took place on the 7th of February 1835, at the age of 57. He was a member of the Royal Academy of Sciences; was first surgeon to two kings; was created a Baron, and was loaded with honours, glory, and wealth! But he was "not born to be happy." Though he had every thing which could be wished for in profusion, he still felt a void; and when in 1834 he met in Italy Esquirol, who, like him, was travelling for his health, he showed an impatience to return home, "And what urges you?" asks M. Esquirol. "My mind is at the Hotel Dieu," he replies. "But you have left the hospital in able hands." "True," says he, "but think of my duty." He soon returned to it, but was speedily removed from its cares and responsibilities.

We are not informed whether M. Dupuytren had any domestic ties, to sweeten the enjoyments and participate in the cares of life, but imagine, from the silence of M. Pariset on the subject, that this was not the case. He is stated to have left a fortune superior to that of Leibnitz, and equal to that of Boerhaave, which was estimated at 4,000,000 francs, (near L. 170,000.) In his will he bequeathed 200,000 francs (above L. 8000) to the erection of a Chair of Pathological Anatomy; but with his permission Government took this upon themselves, and the sum was devoted to the establishment of a Pathological Museum. A part of his fortune was left, we are told, to an illustrious exile, whose name is not mentioned.

M. Lerminier was born in the year 1770, at Saint Valéry-sur-Somme. He received his early education at Abbeville; became a Doctor of Medicine of Paris in the year 1800; and in

1805, received the titles of Medecine Expectant of the Hotel Dieu, and of Physician to the Imperial Family. He followed Napoleon into Spain, Russia, and Saxony; and was distinguished by his courage, humanity, zeal, and disinterestedness. He was appointed Physician to la Charité in 1815, and was a distinguished and discriminating patron of professional merit. Andral and Louis were first known to the world by the publication of cases which came under the care of this eminent physician.

The first memoir of the present volume *is a notice relative to the Plague of Moscow of the year* 1771, *by M. Gerardin.* —As this notice is rather a meagre account of so great an epidemic as that of Moscow, and as M. Gerardin evidently labours under a mistake as to the novelty of the information communicated by him, we shall take the liberty of directing the attention of our readers to the subject in the ensuing article.

Of the Inguino-interstitial Hernia; by Dr G. Goyrand. —In this disease, the intestine, issuing by the internal ring, or an opening in the transverse fascia, instead of passing along the canal and through the external ring, lodges in the cavity of the canal, which it dilates, and in the contiguous cellular membrane of the parietes of the abdomen. Several examples of the occurrence are given.

Of the Disease of Fetters in the Bicêtre in 1792; *by Scipio Pinel.*—The author of this communication is the son of the celebrated Pinel; and the facts here stated were found among the manuscripts of his father. Pinel had long been of opinion, that the insane were only intractable when put in cages like wild beasts, or loaded with fetters, and chained to walls. He was physician to the Bicêtre, and during the Reign of Terror, he obtained from the authorities of Paris, permission to make such changes, as he might deem proper, in the management of its inmates, thinking that a different mode of treatment might be attended with excellent effects. He had no fear in respect to the result of his experiments, though warned of their danger; and he determined on commencing with an English captain, who had been in confinement for forty-five years, and who was regarded as the most violent of all the confined persons, having killed one of the keepers by a blow with his handcuffs. He was approached with great caution and circumspection: but Pinel went into his cell alone, and said to him, " Captain, if I desire your fetters to be removed, and give you permission to walk in the court, will you promise me that you will be reasonable, and do no one any harm?" " Yes, I will," he replied, " but you only jest with me. They are all of them too much afraid of me for that, and you too." "No, indeed," says Pinel, "I have no reason to be afraid, since I have half a dozen men ready to protect me if necessary: but trust in my word; be confiding and tractable. I will give you your liberty if you will only let me put this linen jacket on you, instead of the heavy irons." The captain complied readily with all that was required of him, shrugging up his shoulders, and not saying a word. The irons were in a few minutes completely removed, the jacket put on, and he left alone, with the door open. Several times he rose up, and came down again upon his seat, for he had been sitting so long, that he had lost the use of his legs; at last, however, in about a quarter of an hour, he obtained something of equilibrium, and advanced from the bottom of his cell tottering to the door. His first movement was to look at the sky, and he cried out in an ecstacy, "how beautiful it is." During the whole day he was incessantly moving about, and going up and down the staircase, exclaiming, "how beautiful it is, how admirable it is." In the evening he returned quietly to his cell; slept composedly on a better bed, which was prepared for him, and during the two years that he remained at the Bicêtre, had no return of his violence. He made himself useful in the establishment, exercising a certain degree of authority over the inmates, of whom he was a sort of superintendant. Several other examples are given of a similar kind; and among them, that of Chevingé, a soldier of the French Guards, who had been in fetters ten years, on account of his great strength and violence. He became confiding, attentive, and submissive; and so attached to Pinel, that he several times was the means of saving his life, and once when the mob were leading him *a la lanterne*, as an elector of 1789.

In the space of a few days, fifty-three insane people were freed from their chains; and an unhoped improvement in every respect was the result of a measure which was regarded as impracticable and dangerous.

Of the properties of Corrosive Sublimate in the preservation of Wood; and on the effects of that preparation on the Health of Seamen; by M. Keraudren.—Mr Kyan, the celebrated contriver of the method of counteracting the dry rot in timber by immersing it in a solution of corrosive sublimate, proposed, in September 1834, to the Minister of Marine, the employment of his method in preparing wood to be employed in the construction of ships of war; and on the merits of the proposition the minister consulted the Academy of Medicine, who accordingly appointed a committee of five members to consider the method, and especially the question of its influence on the workmen and seamen.

The author is of opinion, that fermentation of the vegetable juices is the primary cause of the caries or decomposition of wood; and that corrosive sublimate, in combining with the albuminous juices of the vegetable, prevents the fermentative process, and consequently the decay of the wood or the dry rot. He thinks that the insoluble and fixed character of the new combination, and the removal of any adherent portion of the mercurial salt by washing, renders the preparing of wood in this way perfectly innocuous to workmen or sailors.

Observations on the Cure of Wounds without inflammation; by James Macartney, M. D.—The author informs us, that he has for thirty years been of opinion, that, so far from inflammation being necessary for the healing of wounds, it retards that process when moderate, and prevents it when violent; and he has observed that in fishes and the inferior animals, the most considerable solution of continuity healed without inflammation. In ordinary circumstances, and particularly in what is termed healing by the first intention, a deposition of lymph takes place, which is the product of an inflammatory action, that previously exhibited itself in tenderness and swelling of the lips of the wound. When inflammation is, however, prevented, the lips of the wound approach each other, and an obliteration of the opening between them gradually takes place. The object of art is to allay irritation by fomentations, and every kind of soothing application; and Dr Macartney describes an apparatus by which warm vapour can be very conveniently applied.

New experimental researches on Traumatic Hemorrhages, followed by some considerations on the importance of operations and experiments on animals, to form the operating surgeon; by J. Z. Amussat.—The author examines at some length the characters of arterial, venous, and mixed hemorrhages; and of those likewise which take place on the removal of limbs, as well as after partial wounds of arteries. He does not seem to have added much to our pathological knowledge of the mode by which nature effects the suppression of hemorrhage from divided vessels; but he feels it to be highly important for the surgeon and pathologist to institute extensive observations and experiments on animals, if he would aim at obtaining all the most efficient aids for the successful practice of his profession. The ligature with difficulty supplanted the actual cautery in the earlier periods of chirurgical science; but the author considers the twisting of arteries, or the method of torsion, fully as effectual in stopping hemorrhages as the ligature; while it is often more ready in its application, as it only requires the aid of the operator alone, and a pair of pincers, instead of the addition of an able assistant, who is not always to be met with in sudden emergencies. M. Amussat represents this method of securing vessels as advancing, though slowly, and as steadily recommending itself among operating surgeons in France, notwithstanding the opposition with which it might naturally be supposed that it would have to contend.

History of a Cæsarean operation practised successfully, on the 20th of December 1834, *both in respect to the Mother and Child; by Dr Stoltz*, Professor to the Medical Faculty of Strasbourg.—The subject of this case was a Jew girl of Strasbourg, 26 years of age, who had been very rickety in early life. She was only 3 feet 8 inches in height, and the dimensions of the pelvis made the natural exclusion of a full-grown fœtus altogether impossible.

The operation was commenced with an incision made by a convex bistoury, having its cutting edge of a convex form. It began two inches and a-half above the *symphysis pubis*, and extended along the *linea alba*, two inches and a-half above the umbilicus, keeping a little to the left of the latter. The author then cut cautiously through the skin and cellular membrane, so as to expose the aponeurosis and peritonæum, which he raised with the dissecting forceps, and entered after the manner of a herniary sac, when some drops of serum came from the abdominal cavity. He then changed his convex cutting bistoury for a concave one with a button at its end, and with this he cut through the aponeurosis and peritonæum, first downwards, and then upwards, the whole extent of the external incision. The wound was then enlarged at its extremities, so as to make its whole length about seven inches. The uterus was by this means exposed; and the lips of the wound became considerably separated. A portion of intestine presented itself, which was readily put aside. The uterus having being ascertained to be in its proper position, a careful dissection was made through its coats by means of the convex bistoury. The uterine fibres gradually retracted during the division, and the last or innermost layer gave way of itself. The whole thickness of the parietes of the uterus was from four to five lines; and when the division was complete, the membranes of the ovum exhibited themselves. The opening into the uterus was enlarged with the curved and armed bistoury. Before rupturing the membranes, care was taken to keep the parietes of the abdomen so close to the uterus as to prevent the escape of the *liquor amnii* into the abdomen. The membranes were opened with the bistoury, when three or four ounces of water escaped; and the right side of the back of the fœtus exhibited itself. With his left hand, the author took hold of the feet, which he got out without difficulty, and then readily extracted the trunk and head, using the same measures with the arms as in an ordinary footling case. The child, a female, then began to cry. It was full-grown;

was eighteen inches in length, and weighed five pounds and three quarters. The cord was tied and cut in the usual way.

The void produced by the contractions of the uterus made it very important to take every precaution to prevent the protrusion of the intestines. It was necessary likewise to check the immediate discharge of the remainder of the *liquor amni*, and of the effused blood. Dr Stoltz waited some minutes for a sufficient contraction of the uterus, and then he withdrew the placenta, which was attached to the posterior surface of the uterus, a little to the right. Soon afterwards, though with more difficulty, he succeeded in extracting the membranes. The uterus now retired within the pelvis, when a portion of the small intestines appeared in the lower part of the wound, and a portion of omentum in the upper. The former was readily reduced, but on pushing in the latter, a hiccup took place, which, however, soon went off, on the careful replacement of the parts concerned. The lips of the wound were then brought together carefully, and four ligatures applied at equal distances from each other; a seton being introduced into the uterus, to facilitate the escape of secreting fluids. The operation lasted half an hour, and was borne heroically. There was little hemorrhage. The patient during the operation was placed horizontally on her back, with her legs slightly bent, and knees brought together; care being taken to make prudent pressure laterally, and from beneath.

An ample and interesting journal is given of the whole process of treatment, which was extended to seventy days from the operation, before the patient could be said to be quite recovered from its effects. The mother and child were both of them in good health on the 15th of September 1835.

Report on different works relative to Creosote.—This substance, we have repeatedly had occasion to notice in our Journal; and we have only now to state of it, that the reporters recognized the possession of a coagulating property in albumen, particularly when both substances are pure; that creosote has an exciting effect on the animal economy; that it improves the secretion of chronic ulcers; that its local application is useful in removing chronic inflammation of mucous membranes, and in restraining the discharge from leech bites, or wounds of small arteries; that it sometimes abates the pain in toothach; but that, upon the whole, neither in the cases now mentioned, nor in diseases of the skin, in cancer, or in *phthisis pulmonalis*, does creosote do more good than many other curative means which have been long in use. In the preservation of anatomical specimens, it has the disadvantage of an unpleasant smell; but its cheapness and efficiency in this respect make it an important acquisition to the anatomist.

Memoir on the seat and diagnostics of Scapulo-Humeral Luxations, by J. F. Malgaigne.—The author first wrote on this subject in the 3d vol. of the Journal des Progrès, published in the year 1830; and he purposes, in a future memoir, to add to the various and important details of which this communication is composed, the most appropriate means of reduction and treatment. He divides the luxations which form the subject of his paper into four species: 1. The complete subcoracoid luxation, where the head of the humerus appears in the arm-pit, under the *coracoid apophysis.* 2. The incomplete subcoracoid luxation, when the head of the humerus only varies in its position from that of the first species, in having a part of its circumference towards the glenoid cavity. 3. The luxation downwards, when the elongation of the arm is considerable, and there is a great mobility of the head of the humerus; and 4. the subscapular luxation, when the head of the humerus cannot be felt in the arm-pit, but is lodged within the *coracoid apophysis,* in the subscapular fossa of the shoulder-blade. The capsule of the joint is ruptured in all those luxations, except that of the incomplete subcoracoid.

Researches on the poisonous principle of the Bitter Yucca; by Mess. O. Henry and Boutron-Charlard.—The authors give a chemical analysis of the juice of this vegetable, and form the conclusion, that its poisonous principle is identical with the hydrocyanic acid.

Note on Lithotrity, as applicable to children of early age; by M. J. Leroy d'Etioles.—It has generally been considered, that this process cannot conveniently be employed in children of five or six years of age; but the author gives four examples of successful lithotrity, at the ages of six, four, and three and a-half; and he mentions one, in which, from an accident to the instrument at the third sitting, the operation of lithotomy became necessary; and accordingly the bilateral operation was performed by M. Dupuytren.

As the operation of lithotomy is most successful in early life, when lithotrity produces more irritation than in the adult, the author is of opinion, that the operation is only advisable when the calculus has been ascertained to be of small size, and when, therefore, a very small number of sittings is necessary for its removal.

Anatomical and Physiological researches on the organ and function of Hearing in Man and vertebrated animals; by G. Breschet.—The attention of the author, he informs us, was first directed to the subject of the ear, by having occasion, in the year

1815, to prepare in the concours for the appointment of assistant dissector, a series of preparations relative to that organ. He deposited his preparations in the Museum of the Faculty of Medicine at Paris, and presented the result of his researches in various memoirs to the Academy of Sciences. As the memoir, thus formed, therefore, constitutes a complete treatise on the organ and function of hearing, and has further been published in a separate form, we think it best to devote to it a separate article, and an account of it will be there found.

Report of M. Itard, on a Memoir entitled Researches on Deafness, considered particularly in reference to its causes and treatment ; by M. Gairal.—Deafness is divided by M. Gairal into five species ; hereditary, congenital, that arising from accident or disease, the deafness of age, and that which is denominated simple or double, from the extent of the malady ; but to this classification, and to the pathological views which are connected with it, M. Itard offers many objections.

With regard to the curative processes connected with deafness, the two principal are, *perforation* of the membrane of the tympanum, and *catheterisme* of the Eustachian tube. The former is considered by M. Gairal as indicated by various local affections, particularly thickening of the membrane, and by an occlusion of the Eustachian tube. But M. Itard is not disposed to consider thickening of the membrane as a necessary cause of deafness ; and neither in this, nor in the case of occlusion of the tube, has he ever seen much benefit derived from perforation of the membrane. In 1821, he performed the operation a great number of times in the most favourable cases, with only one successful result ; and has since that time repeated it thirteen times, and with his usual disappointment. Still, however, he thinks it may be useful, as affording a means of throwing injections into the ear, but not by the mere admission of atmospheric air.

Catheterism of the Eustachian tube, according to M. Itard, commonly apply to cases of mucous, or purulent congestion in that organ ; but here he thinks the advantage of the practice is limited to the introduction of water or air, with or without the addition of medicated substances. Though M. Gairal's apparatus for reaching the Eustachian tube is exceedingly ingenious and satisfactory, his experience affords little encouragement for its employment, since the introduction of air, as a douche, produced only two cures, in 238 cases in which it was used.

New Philosophical deductions applied to the Study of Idiotism and Insanity ; by F. Dubois.—Idiotism, the author divides into three classes. In the first, there is only a vegetative existence, with no appearance of reasoning or instinctive faculties. The unfortunate subjects of it possess a mere automatism: and the functions of life which they exercise are independent of volition. The second class consists of such as have instinctive, without reasoning faculties. They avoid painful, and seek agreeable impressions, and may be regarded as somewhat in the position of some of the lower animals. In the third class, the intellectual powers are developed up to a certain point, but the exercise of reason is very limited. In all the three classes, there is much disposition to affections of the nervous system, particularly paralytic complaints. The subjects of the first variety generally live but a short time; those of the second seldom get beyond thirty; but the third have the usual limits of life. Of 100 idiots whose cases were made the particular subject of observation at the Salpetriere, 14 only, and those of the third class, had any regular conformation of cranium; but, at the same time, the author is of opinion, that in idiocy, there is a concurrence of many organic deviations, and not one only, as Gall and Spurzheim erroneously conceived. It was owing to this mistake that the former mistook the skull of the poet Gresset for that of an idiot.

Psychological remarks on the two Siamese Brothers; by Dr Dubois.—It is well known that there is only an union between those youths in a portion of the capillary circulation, without any thing common in their organic structure. They are therefore two entirely distinct beings, in whom a conviction of the necessity of constant and cordial co-operation has produced a similitude and accordance of habits. The appetite for food is not always alike, though they eat at the same time; and the alvine function is not always similar. There are sexual desires, but a feeling of decorum prevents their indulgence.

Notice by M. Bousquet, relative to the Cow-pox discovered at Passy, near Paris.—Of the substance of this article, and the discussion to which it gave rise, we formerly gave a short account in our forty-sixth volume, p. 244; and we at the same time added some historical facts relating to the rediscovery of the vaccine virus in this country. To that article we would again direct the attention of our readers. At present we merely add, that M. Bousquet was satisfied, by vaccinating with the lymph eight children, that the vesicles were genuine cow-pox, and that the lymph which they contained was capable of generating the true vaccine disease.

Very good figures of these vesicles and pustules are given in a fine lithographic engraving in the sixth volume of the Transactions.

In a notice appended to the present volume, we are informed, that a considerable change is intended to be made in the future publications of the Royal Society of Medicine. These publications will in future consist of *Memoirs* and *Bulletins*. These memoirs will comprise communications of some extent, which will continue to be published in 4to, but at no regular or defined periods; though it is hoped that there may be sufficient materials to allow of the appearance of one volume annually. The bulletins, under the designation of *Bulletins de l'Academie Royale de Medecine*, are intended to appear twice a month, and to comprise two sheets at least, of letter-press in 8vo., at the expence of 15 francs per annum. They will give a history of the proceedings of every meeting of the society, and will include, not only a short notice of such papers as are meant to appear in future volumes of memoirs, but also an account of all such shorter communications, and of the discussions to which they may give rise, as could have had no place in the former Transactions of the society.

Part of the plan now proposed has already been carried into effect in the sixth volume of the memoirs, which has reached this country since the foregoing account of the fifth was prepared. In that volume, viz. the sixth, after a short report on the epidemics, which have prevailed in France from 1830 to 1836, by M. Piorry, terminated by some valuable tabular views, we find 312 quarto pages, or not much short of one-half of the volume, occupied with the memoir, or rather treatise of MM. Trousseau and Belloc on laryngeal consumption, of which we gave a full and minute account in our last Number.

This is succeeded by another rather lengthened memoir by Risueno D'Amador, Professor to the Faculty of Medicine of Montpellier, on the objects, uses, and limits of pathological anatomy, and on the influence it has exercised on medicine from the time of Morgagni to the present hour. Of this memoir or rather treatise, we have hitherto given no account; and were we to do so, it would be out of place at the close of the present article, since the author enters at so great detail, and so fully into the consideration of his subject, that perusal, and that of the most attentive description, can alone convey an idea of the nature of his paper. This treatise occupies 291 quarto pages of the volume.

This is followed by a paper of more moderate limits, containing researches on the history of Sago, and examination of the Cayenne Sago, extracted from the Sago tree of Madagascar, by M. Planche. Of this paper, which occupies twenty quarto pages, we propose to give some account in the Medical Intelligence.

The last article in the volume is a long, elaborate, and rather instructive memoir on glanders and farcy in the human subject, by

M. Rayer, in which the author gives a good history of most of the facts hitherto collected on this subject, and illustrates its symptoms by numerous cases, and its morbid anatomy by dissections and coloured delineations of the diseased parts. Of this memoir, which occupies 246 quarto pages, we may, on some future occasion, when our limits permit, give a more full and particular account.

We cannot conclude the foregoing short and hasty notice of the contents of these volumes, without saying that they afford most convincing proofs at once of the activity and energy of the members of the profession in France, and the great advantages of judicious encouragement bestowed on the Academy by the government. It is quite clear, that, however indefatigable were the diligence, and however unremitting the zeal of the physicians and surgeons in France, either none, or very inadequate effects would be the result, without that patronage which the Academy receives from the public authorities. It is the existence of the Academy that enables its members to concentrate their energies, that encourages individuals to cultivate with diligence and success particular branches of medical and physiological inquiry, and that eventually brings the results of these labours in a useful shape before the public. In the investigation and elucidation of subjects so abstract, and where the practical applications are often not very direct, individual efforts would languish and expire, where no hope is held out of allowing their difficulty and their value to be made generally known and duly appreciated; and the dignity and influence of the Academy in this case renders an important service at once to the country and to the members of the profession. Such cares are worthy of the character of an enlightened government, who has not yet learned to view scientific pursuits, and their cultivators, if not with contempt, at least with cold indifference, and who think, that a small pittance of pecuniary assistance, employed in facilitating the progress, and diffusing the knowledge of the useful arts, is not among the least effectual means of contributing to the great object of increasing the amount of human happiness, and extending the means of human improvement.

ART. II.—*Notice relative to the Plague of Moscow of the year* 1771. By M. GERARDIN. (From the Mémoires de l'Académie Royale de Medecine, Tome v.)

IT may be proper to premise that, in the year 1770, an epidemic febrile distemper, which in no long time presented all the characters of genuine glandular and carbuncular oriental plague, broke out in various parts of Moldavia and Podolia, and eventually spread with the most deadly ravages over the central and southern provinces of the Russian Empire, where its attacks were most conspicuously signalized in the cities of Jassy, Kiev, and Moscow. Descriptions more or less minute of this pestilential epidemic were given by De Mertens, an Austrian physician, who had the charge of the Orphan Hospital of Moscow, Samoilowitz, a military surgeon at Moscow, and Gustavus Orræus, member and councillor of the college at St Petersburg.

In every pestilential epidemic it ever becomes with physicians a most important inquiry to ascertain the first individual attacked by the disease, and the first commencement of so sweeping a distemper. And, accordingly, after the plague appeared in Jassy, it became a point of the greatest importance to ascertain where it first commenced, and by what means it was conveyed to this city. Orræus, accordingly, and indeed all the other authorities, agree in stating, that, in the month of September 1769, upon the defeat of a numerous body of Turks who had assembled round the Castle of Chozim, and their dispersion through Moldavia and Wallachia, one regiment, under the command of Lieutenant-Colonel Fabrician, had, about the end of November, encountered and defeated, near Gallaz, a town on the further bank of the Danube, a considerable body of the infidel forces, and had taken prisoners several of their chiefs, as well as many of the common soldiers. The commander placed a garrison in the town, and distributed his sick and wounded among the inhabitants; and after a few days several of the garrison-soldiers and sick, and one assistant-surgeon, died with symptoms of plague. Of the soldiers who mounted guard on Mavrocordato, the captive Prince, two died in the same manner. It was not at this time known that the plague had been brought from Constantinople in the Turkish ships; and though the place was evacuated after these accidents, it was doubted by some, whether the disease really was genuine plague.

The regiment of Lieut.-Col. Fabrician meanwhile returned to Jassy, the capital of Moldavia, where the healthy sojourned in the houses of the citizens, and the sickly were quartered in a military hospital, which had been established in the palace of the Moldavian princes. Seven weeks elapsed without any remarkable accident. But before the middle of January 1770, the hospital surgeons observed, not only many petechial fevers, but in several of them, after the seventh or eighth day, unusual buboes in the groin. The wounds and sores also became gangrenous; and a common soldier, who had been slightly wounded in the battle of Gallaz, having packed up a Turkish pelisse in his baggage, when he arrived at Jassy sold it to a Jew, who, having endued his person with this garment, was next day attacked with plague, as also two children who slept in the same bed, and speedily destroyed.

This unexpected casualty attracted little attention from the

magistracy of Jassy. The house of the departed Israelite, indeed, was shut up; but no steps were taken to prevent free intercourse between the soldiers and the civilians with whom they lived.

In the meantime, about the end of March, some confused and discordant accounts of the prevalence of the disease at Jassy were conveyed to Latitschev, a town of Podolia, 350 Russian leagues from Jassy, and which was then the winter quarters of the Commander, Count Romanzof; but while some reported only the extremely sudden deaths of persons apparently well, falling down in the streets, others, on the contrary, reported the disease to be merely a malignant form of fever. The latter report was most favoured by the authorities; and the result was, that a distemper, truly pestilential, was allowed to rage without control or resistance the whole of the month of March 1770. At length, however, General de Stoffeln sent from Jassy, on the last day of April, a messenger to the Commander-in-Chief, Count Romanzof, announcing in Jassy the existence of genuine plague, attested by the certificate of a physician to the army and five surgeons; and on the 5th of May an order, requiring Orræus, then at Michelpol, in Podolia, to proceed immediately to Jassy, arrived, and on the 7th he arrived at the Castle of Chozim, where he found several ill with petechial fever; and afterwards at Batuschany, where he found 70 hussars already dead of plague, and 32 ill in tents of the same disease; of a body of infantry of 120, more than 40 already dead, and 17 ill; several Cossacks of 20 dead, and 1 ill; and 1 assistant surgeon and 2 barbers, also victims to the fury of the disease.

On the 10th of May 1770, Orræus reached Jassy, the capital of Moldavia; and found there every thing bearing evidence of the prevalence of a most general and fatal distemper. Hospital accommodation was forthwith provided for the sick. But in the course of about six weeks, of 413 persons who were admitted into that of which Orræus had charge, 216 died. Meanwhile the disease spread insidiously and gradually among several towns and villages, both of Moldavia and Wallachia, but in no place produced so great mortality as at Jassy.

At length the disease, in its onward progress from Moldavia and Wallachia, advanced within the frontiers of the Russian Empire in the beginning of the autumn of 1770, and appeared in the frontier city of Kiev, in consequence, as was supposed, of importation by merchandize from some of the towns of Podolia. In this place, as in many others, it subsided at the approach of the cold of winter, and, after the commencement of 1771, was believed to have disappeared from Kiev entirely. It reappeared, however, in the beginning of the spring, and then advanced to various towns between that city and Moscow, as Braensk and Sewsk, which are situate half way between the two cities. In Kiev the plague had at this time destroyed, according to De Mertens, 4000 persons.

All communication between Kiev and Moscow had been completely interrupted in the autumn of 1770. But either this precaution must have been unavailing, or the disease must have arisen spontaneously in the ancient capital of Muscovy. Certain it was, that at the end of November 1770, Jewsajevsky, the surgeon and prosector of the military hospital of Moscow, after treating an officer who died in the neighbourhood of the hospital, was forthwith attacked with a malignant petechial fever, and died on the third day. The hospital-assistants, who, with their families, resided in two separate chambers, were attacked in one chamber, one after the other, with their wives, to the amount of eleven persons, with an acute disease, with petechiæ, and in some with buboes and carbuncles; and most were cut off between the third and the fifth days of the disease. Those in the other chamber were attacked and mostly destroyed in the same manner. This event Schafonsky, the chief physician of the hospital, immediately reported to the city physician, Rinder; but as the latter individual maintained that the disease was merely an intense form of malignant petechial fever, Schafonsky reported the circumstance to the Governor, Count de Soltekov. A meeting and consultation of all the physicians in Moscow was accordingly held on the 22d of December; and upon considering carefully all the circumstances, the members came to the conclusion, that the disease was to be regarded as true plague; that the general hospital should be shut; and that all communication with the rest of the city ought to be forbidden; and the same day the hospital was surrounded by a cordon of sentinels. It was ascertained, that of all the persons of different ages and both sexes residing in the two houses, and who amounted to 30, 22 had died, 5 were convalescent, and only 3 remained.

No distinct proofs were afforded that the disease was either extinct, or was proceeding by slow but steady progress to affect the city. It is probable that the latter was the case, as Orræus states, that undoubted marks of the contagion appeared during the months of January and February;—an important and curious circumstance, if really the case, since it shows that the usual opinion, that plague is entirely extinct in the dead of winter as in the heat of summer, is liable to certain exceptions. Certain it was, that, on the 11th of March, it was reported to the city police that a most contagious disease was raging in the great cloth-manufactory at the Stone Bridge, containing about 3000 workmen, and that the dead were, in no small numbers, secretly carried out every night for interment. Dr Jagelsky was immediately sent with a police-officer to make the requisite inquiries, and he ascertained that a disease, attended with petechial eruptions, carbuncles, and buboes, which he observed both in the living and in the dead, had destroyed, since new year of 1771, 113 persons. On this account, the physicians were again summoned by the governor-general of the city to a meeting, and their opinion was requested after careful inspection on the spot. A committee of five, deputed for this purpose from the general body of physicians, on the 11th of March 1771, having examined in the manufactory 8 dead bodies and 21 patients, found in all the characteristic symptoms of plague; but in the report signed by the general body, they declared the disease to be putrid, contagious, most dangerous, and in its symptoms and various circumstances, to make a near approach to plague. In consequence of this opinion, it was conceived requisite to take immediate measures for opposing, and, if possible, arresting the further progress and diffusion of the disease through the community. The workmen of the factory already ill, were, with their families, sent to the Ugresch Monastery; the uninfected were removed without the city to several empty manufactories; and they were provided with all necessary articles, both of food and clothing; while a cordon of sentinels was drawn round them to prevent entirely communication with the others. The infected manufactory was also shut up, and all access to it prevented by means of guards. The use of the public baths was also forbidden; and all the inhabitants were enjoined to report immediately every case of sickness and death, to the examination of which certain physicians and surgeons were appointed.

Notwithstanding the assiduous employment of these precautions, the disease ceased not to diffuse itself through the city; and the physicians and surgeons entrusted with the care of the inspections met with dead bodies, bearing marks of plague, not only within houses, but also in the streets. Not a few of the workmen, indeed, dreading imprisonment, fled from the infected manufactory, and concealed themselves in the city; and it was impossible to find many of those residing without the walls of the building. Meanwhile, some physicians and surgeons, who loudly denied the existence of pestilence, were flattered by the incredulous populace; and some professional persons went so far as, by means of written documents and letters sent to Petersburg, to press on various of the nobility this opinion, supported by futile arguments. At this time, viz. on the 18th day of March, Orræus proceeding from Jassy towards Petersburg, by Moscow, was requested by the Governor-General, Count Soltekov, to undertake a careful examination of the sick, and the bodies of the dead, and to report the truth without any disguise. Orræus accordingly repaired in company with the officer of police and Schafonsky to the residence of the infected persons without the city; and upon their examining the sick, and also the bodies of the recently dead, he recognized in all respects, both as to the general symptoms and pathognomonic characters, exactly the same disease which he had already witnessed at Jassy. After this positive declaration, many of the nobility fled from the city, and retired to their country seats, while not a few abused Orræus as a deceiver. All the professional persons, however, excepting two, Kuhleman and Skiadan, who continued recusants, adopted his views, and readily furnished to the Senate their testimony to the same effect.

Meanwhile, means of disinfecting houses and persons already tainted with the disease, and preventing communication with uninfected districts, were diligently and rigorously carried into effect. All the roads proceeding from Moscow were put in a state of blockade; and every means of ventilation, fumigation, and purification, were put in energetic requisition in the city and its suburbs. It seems partly owing to these measures that, during the whole of the months of May and July, the disease made no great progress among the inhabitants, and it had almost disappeared among the workmen of the great cloth-manufactory without the city. About the middle of July, however, it began again to prevail with great virulence, cutting off entire families, especially in the suburbs, and causing many persons to be found lifeless in the streets. The servants of the police employed in the perilous duties, as grave-diggers, hearse-drivers, workmen, soldiers, and others were, from constant handling of the dead, and neglecting the cautions prescribed, daily infected and destroyed by the disease; and in their place were substituted condemned felons from the prisons, with the condition that, if they survived the plague, they should recover their liberty. As these were still too few to discharge the duties, workmen from the various manufactories and workshops already out of work, from the suspension of business, were employed with ample wages. As the number of the infected increased daily, and the Ugresch Monastery was unable to contain all, the Simeon Monastery, also situate without the city, but at a shorter distance, was evacuated by order of the government, and fitted up as a pest-hospital. Soon after, tents were erected in the open fields for the infected; and many citizens of better condition were allowed to remain in their own houses. For receiving those merely suspected, and placed under quarantine, the Andronensian Monastery, and several other large buildings in the suburbs were set apart. So far, however, were all these means from being sufficient to accommodate in pest-hospitals, all attacked with plague, or even the greater number of them, that the greatest part expired in their own houses before it was known that they were ever ill,—an evil partly the effect of the extent of the city, partly of the obstinate resistance of the inhabitants to the precautions recommended. Towards the close of August, the disease became so violent, that the daily number of the dead arose to forty and upwards. In this calamitous state of the public health, all necessary communication was carried on under the most rigid restrictions; and all articles of food and similar necessaries were sold under condition, that the sellers should receive the money through vinegar, the general use of which was also ordered, both as ordinary drink, and for sprinkling houses, and the hands and faces of those exposed; and that the rule might be readily enforced, the article was furnished to the poor gratis.

In the month of September, the disease seemed to have attained its greatest intensity and virulence; for every day, beyond 600, and sometimes 1000, deaths took place. At this time, Moscow seems to have become a prey to all the calamities and distresses of a town in a state of pestilential sickness. The populace, from suspicion, ignorance, and superstition, could not be made to observe with attention, the necessary precautions, or to give timely information of new attacks, and the occurrence of pestilential deaths. Many were deserted by their friends and others, and allowed to die unaided, and unknown, while their dead bodies were found afterwards in a state of loathsome putrefaction, or were buried privately in their houses and gardens. Thefts and robberies were perpetrated to a great extent, and without the means of detection or punishment.

Towards the middle of September, when the deaths were daily augmenting in number, the people, surrounded by the dead and the dying, and labouring under the grossest ignorance and superstition, abandoned themselves to the most desperate excesses. Regarding the plague as a scourge sent by heaven to punish them for the neglect of religious ceremonies and duties to the sick and dying, they, on the 15th of September, broke forcibly and tumultuously into the hospitals and other places where suspected persons were kept, with the intention of embracing for the last time the dying, and interring the dead within the city. Though this disturbance was gradually allayed by General Eropkin, it was followed by a great apparent increase in the virulence of the disease; and more than 1200 are stated to have died daily at this time.

Another very shocking excess was perpetrated on the 16th of September. Ambrose, the venerable metropolitan archbishop of Moscow, had hitherto escaped the disease; and his immunity was superstitiously ascribed to the protection of an image esteemed miraculous in the cathedral. The populace forthwith rushed in crowds to prostrate themselves before this imaginary protector. In this duty those already infected were mingled with those in whom the disease had not yet appeared. The former were not cured, as they had fondly imagined; the latter were attacked by the disease. The archbishop, desirous to put a stop to this new source of calamity, caused the object of their superstitious idolatry to be removed. Incensed to madness with this act, the people broke in a body, on the 16th of September, into the monastery within which the archbishop had withdrawn, and massacred him in the most merciless manner.

The ascertained number of all who were cut off during this month amounted to 21,401,—a degree of mortality which may be regarded as remarkable, considering the previous depopulation of the city, and the emigration of so many inhabitants. And during the same month, in consequence of the forcible re-establishment of the religious ceremonies at the interment of the dead, almost all the priests and ministers of the church were attacked and destroyed by the disease.

It was the close of September before the populace became manageable and amenable to advice, and desisting from the practice of concealment, reported their sick and dead, and evinced a desire to enter the hospitals spontaneously. As the Simeon Monastery Hospital was not sufficiently large, the old Imperial Palace, and the Pokrov Monastery were both applied to this purpose; and as there was at the same time a deficiency of medical officers in the Simeon Monastery Hospital, and as those who there conducted the treatment acted rather reluctantly, a circular was sent to all the physicians and surgeons, inviting them to afford their assistance, not only by liberal rewards to themselves, but by provisional allowances to their widows and children, in the event of death in the course of their services. In consequence of this invitation, two physicians, Pogoretsky and Melzer, with many surgeons, under surgeons, and feldschers, or barbers, readily undertook the duty of prescribing for and treating the sick.

All mendicants were at the same time seized by the officers of police, and conveyed to the Ugresch Monastery, where they were clothed and maintained at the public expense.

Though the disease was still, in the commencement of October, very violent, towards the end, however, it began to abate somewhat, so that the number of deaths was only above 17,000, and therefore some thousands fewer than the previous month. The weather at this time was rainy, cloudy, and rather warm, and was believed thereby to promote the continuance of the disease. At this time many wooden houses, which death had rendered tenantless, especially in the suburbs, were burnt, with all their furniture; and of others hitherto shut up for the same reason, all the furniture and articles, excepting images of the saints, necessary writings, and articles constructed of metal, were collected by special officers, and, with due caution, conveyed to places where they were consumed in heaps.

As, however, it was impracticable to carry this system of demolition beyond certain limits, the College of Health resolved to call in the aid of fumigation, and accordingly recommended the fumes extricated from juniper, guiac, nitre, sulphur, and, in some instances, olibanum and storax in a state of combustion. At this time a curious experiment was made, in order to ascertain, if possible, the efficacy of these fumigations. By the permission of the senate and the Prince, seven condemned felons were conveyed from prison to a house close to the Simeonite monastery, which had been fumigated forfour days successively, twice each day; and, their own clothes being thrown aside, they were clothed with the garments of persons lately dead of the plague, and which, though soiled with the discharge of buboes and carbuncles, had also been fumigated for four days, and ventilated for other six days. Almost beyond expectation, these persons remained well and safe for sixteen days; and hence, being promised their liberty, they were dismissed with the permission of associating with the healthy. This experiment was believed to be decisive as to the efficacy and the immunity afforded by the fumigation, which was accordingly employed with the greatest confidence. Orræus adds, that these fumigations were used in various other places, and that after their employment the plague nowhere reappeared. To those who would urge the objection that the disease was now on the decline, and that its efficient cause was less energetic in operation than at first, Orræus answers, that its virulence was still sufficiently evident, in the fact that, in the month of November, the deaths from the disease were still above 5000; and in that of December they exceeded 800 (805 exactly.) The experiment was at all events conceived adequate to justify confidence in the fumigations; and they were accordingly carried on with great assiduity and very generally through the city, under the superintendence of respectable officers employed at suitable salaries.

At length, as toward the close of December, proofs of a more healthy state were beginning to appear, the disease seemed about the commencement of 1772, very rapidly to subside, and on the 5th day of January, not a single person, cut off by plague or any other disease, could be found in the city.

Though Moscow, as a large and populous city, had suffered most severely from the ravages of this epidemic distemper, yet in other towns and villages it had caused itself to be felt and remembered. It had penetrated to Borowsk, Kaluga, Tula, Jaroslav, and other places; and had only been prevented from committing equal havoc, by the less dense population of these towns, and the greater facility in carrying into effect rigorous prophylactic measures.

Towards the time at which the disease began to abate in virulence, Orræus remarks that a considerable change in the state of the weather was observed to take place. From the middle of December to the 12th of January a north-east wind blew almost without interruption; and the cold was moderate, with a cloudy sky, occasional storms, and abundant snow. On the 9th of January there was an unusual rise of the mercury in the barometer, and for three days it was stationary, almost at the same degree, with pretty intense cold.

About the middle of February it was reported to the College that many dead bodies were found secretly unburied or otherwise concealed; and the removal and interment of these, with the subsequent disinfection of the places, occupied much time and labour as well as solicitude.

The following Table of the Deaths for the plague year and the four subsequent ones, is given by Orræus; and it is proper to observe, that the first is given by M. Gerardin as if it were altogether new.

	1771.	1772.	1773.	1774.	1775.
January,	- -	330	468	494	595
February,	- -	352	468	473	598
March,	- -	334	589	599	811
April,	744	374	611	596	869
May,	851	285	675	608	699
June,	1099	247	834	709	828
July,	1708	276	945	810	905
August,	7268	354	804	796	1254
September,	21,401	238	525	635	
October,	17,561	268	403	550	
November,	5235	284	415	580	
December,	805	350	458	677	
	56,772	3692	7295	7527	6559

On these tables Orræus and De Mertens make the following remarks. 1. That the number of deaths during the time of the plague was much greater than appears in this table, is evident from the circumstance, that many dead bodies were afterwards found in houses and concealed places, and also from this, that from many at the commencement of the distemper, scarcely any report was given, and afterwards they were reported with much irregularity. In the number returned to the senate and council of health, the number of deaths by plague exceeded, according to De Mertens, 70,000; and if to these be added the number of those privately and secretly buried, he thinks the number cannot be under 80,000. Including those dead in more than forty villages and the towns already mentioned of Tula, Jaroslav, and Kaluga, De Mertens is of opinion that this disease destroyed not fewer than 100,000 persons. 2. The small number of deaths in the year 1792 is to be traced both to the natural consequence of the previous destruction of so many thousand citizens, and the continued absence of many in the provinces, and also to the healthy constitution which immediately ensued on the cessation of the plague. And 3. in the years 1773, 1774, and 1775, the mortality was remarkably increased, because the great concourse of people supplied subjects, while various diseases prevailing generally, especially bad fevers, cut off many of the increased population.

Among 12,538 houses which were counted at Moscow at the time of the plague, 3000 and rather more were reported as places of which all the tenants were dead, and about 6000 were reported infected. Besides 117 churches, numerous colleges also, manufactories, and other public buildings, so far as they were liable to infection, or the suspicion of infection, were expurgated during the winter by fumigation and ventilation.

In the month of March and the succeeding months, no more was heard of plague or pestilential symptoms, and the quarantine restrictions were successively diminished, both on the high road to St Petersburg, and on others, and the transport of merchandize, though under certain cautions, was re-established.

The fatal effects of this epidemic may be estimated from the following facts. Between December 1770 and March 1771, when the greatest influx of strangers and inhabitants takes place, it was calculated that the population amounted to 250,000, and according to some to 300,000. As they begin in March to return to the country, it is supposed that at least one-fourth part of the inhabitants must be absent during the summer season. During the summer of 1771, however, the apprehension of the plague had driven so many from the city, that it is believed by De Mertens, that in the month of August not more than 150,000 remained at Moscow. Allowing, therefore, that of this number 80,000 were cut off by the disease, it appears that the mortality was at least 53⅓ per cent., or considerably more than one-half of the whole population. M. Gerardin estimates the number destroyed by the epidemic to have been 60,000 only; but they are, according to various documents and considerations, placed so high as 80,000 by De Mertens, who, we believe, being upon the spot, had good means of information. It is remarkable that neither De Mertens, Orræus, Samoilowitz, nor M. Gerardin, in their eagerness to furnish the amount of mortality, give us any information on the number of recoveries; and we are left to infer, that few or none survived the attack of the epidemic, and, what is still worse, we are left completely in the dark as to the relation of the mortality to the number attacked by the disease. Had this information been furnished by the present author, his notice would have possessed at once greater novelty and value than it does. In its present form, it is, we regret to say, less valuable than the account either of De Mertens or Orræus.

ART. III.—*Recherches Anatomiques et Physiologiques sur l'Organe de l'Ouie, &c. Anatomical and Physiological researches on the Organ of Hearing and Audition in Man and Vertebrated Animals.* By GILBERT BRESCHET, Member of the Institute of France, Doctor in Medicine, &c. &c. 2d edition. To which is added an Account of the Nervous Plexus of the Tympanum. 4to. Paris, 1836. Pp. 296. Thirteen Plates.

THE anatomy and physiology of the ear have hitherto been less attended to by medical men than they deserve, and, as a necessary consequence, the diseases of the organ have been treated according to an empirical method, which seldom fulfils the expectations of either the patient or his attendant. This cannot be attributed to the paucity or scarcity of works descriptive of its structure; for, since the year 1560, upwards of sixty treatises of merit have been wholly or partially devoted to this subject. But, in the first place, to the rapid manner in which lecturers generally hurry over this part of their course; and, in the second place, to the want of institutions placed under the direction of competent surgeons, in which the student might see as much of the diseases of the ear as might interest him in the study of it, and receive the instruction necessary to enable him to engage in this branch of his profession, with benefit to the community and satisfaction to himself. If to these we add, that the anatomy, physiology, and pathology of the organ very seldom form any part of the examination which the student undergoes before the medical boards of this country, it will not appear wonderful that, with no stimulus to the study when there was time for its pursuit, the medical man, after being engaged in practice, should find himself wholly ignorant of this department of his science, and be by no means anxious to question the pretensions of those persons, male and female, who, under the denomination of aurists, proclaim themselves conversant with all the diseases of the ear, although grossly ignorant of the structure of its various parts, and fearlessly promise infallible relief to the most hopelessly deaf. With the view of contributing to the termination of this state of matters, we propose, on the present occasion, to give a condensed analysis of M. Breschet's work on the Anatomy and Physiology of the Ear, and shall embrace the first opportunity which may hereafter be presented to us of laying before our readers a view of its diseases and their treatment.

After enumerating the authors whose works have thrown light on the anatomy and structure of the organ, and explaining the nomenclature which he proposes to adopt, M. Breschet proceeds to consider, 1*st*, the structure of the organ as a whole in vertebrated animals; 2*d*, the labyrinth or internal ear in man and other *mammalia;* 3*d*, the fluids contained in the labyrinth; 4*th*, the lithoid and pulverulent concretions found therein; 5*th*, the aqueducts; 6*th*, the peculiarities of the internal ear of the different *mammalia*; 7*th*, the cochlea; 8*th*, the nerves of the ear; 9*th*, the physiology of the labyrinth; 10*th*, the views entertained by different authors regarding communications in the *cranium*, between the sympathetic and encephalic nerves, and the formation of the plexus of the *tympanum*. The last chapter is devoted to the description of the plexus of the *tympanum*, and the otic ganglion of Arnold in man and vertebrated animals.

I.—GENERAL VIEW OF THE EAR IN VERTEBRATED ANIMALS.—After stating that smell and taste are but touch rendered more delicate, and that in the eye and ear a concentrating apparatus is superadded, M. Breschet divides the organ into two parts, the sensitive and the auxiliary.

1st. *Sensitive part of the Ear.*—The essential constituent of this is the auditory bulb, around which the semicircular tubes and cochlea are successively grouped. In the most rudimentary form of the ear the bulb is observed. Next in point of frequency we find the semicircular tubes, which are met with in all vertebrated animals, except the *cyclostomi.* The *tympanum*, which the author ranks with the auxiliary portions of the organ, occurs more frequently than the *cochlea.*

a. *Auditory Bulb.*—The auditory bulb is a species of sac filled with a clear albuminous fluid, called by the author *endolymphe*, in which a concrete substance, to be afterwards described, is found floating. Around this concretion a portion of the auditory nerve is expanded. The sac is formed of a thin transparent membrane, and perforated on the side next to the brain by the nerves. The impressions made on it by sonorous vibrations are communicated by means of the endolymph to the concrete substance, which is in direct contact with the nerve. In mammalia the sac is invariably found in the lateral parts of the head, either in the substance of the parietes or in the cranial cavity, between the fifth and eighth pair of nerves.

b. *Apparatus of the semicircular tubes.*—This apparatus, found in all vertebrated animals, except the *cyclostomi* of Duméril, is placed above and more frequently behind the auditory bulb, to which it is applied, though no communication exists between their cavities. It consists of a flattened sinus called the median or utriculiform sinus, from which issue three semicircular canals. At its anterior extremity, the *ampullæ* of the anterior and external semicircular canals are found, and at its posterior extremity that of the posterior, while a prolongation from its middle receives the unenlarged extremities of the anterior and posterior canals. According to M. Breschet, whenever these tubes exist, their number is always three. The anterior and posterior, placed vertically or parallel to the axis of the body, are always nearer to the cranial cavity than the external, which is commonly horizontal. Each tube has two extremities, one enlarged and the other not, the former receiving the name of *ampulla.* The *ampullæ* of the anterior and external tubes communicate with the anterior extremity of the median sinus, the latter being a little behind the former. The posterior *ampulla* communicates with the posterior part of the sinus. Each *ampulla* receives a nervous filament. The unenlarged extremities of the anterior and posterior semicircular tubes unite above and terminate in the prolongation of the median sinus, while that of the external canal opens into the same cavity behind the posterior *ampulla.* The whole of this apparatus is formed of the same tissue as the auditory bulb, and filled with an albuminous fluid. In those fishes in which it is well developed a small concretion provided with a nerve is found at the anterior extremity of the median sinus, immediately under the *ampullæ* of the anterior and external semicircular tubes. In what manner this particular form of the apparatus favours hearing has not yet been ascertained.

c. *The cochlea.*—This apparatus exists in a perfect state only in the mammalia. In birds and reptiles it is only rudimentary, and among fishes in the *clupea,* which have so complicated an ear, there is merely an indication of its existence, at least something is observed occupying its place. To constitute a true *cochlea,* there must be two spiral membranous tubes, terminating by one of their extremities in a point, and separated from each other by a very thin fragile lamella. Were these tubes uncoiled they would appear of a conical form. The base is always towards the auditory bulb. Their walls are very delicate, and their cavity is filled with a limpid fluid, in which M. Breschet found calcareous concretions, especially in birds. One of these tubes opens on the auditory bulb, the other terminates at the cavity of the *tympanum.* The former is denominated by M. Breschet the vestibular, the latter the tympanic tube of the *cochlea.* The cochlea of *mammalia* is contained in a very hard osseous substance, which is moulded upon it, so that this mould exhibits the exact form of the tube contained within it, and has hitherto almost always been examined instead of it. The spiral canals, in which the bulbous tubes of the cochlea are contained, are called *scalæ.* The tympanic scala containing the tympanic tube terminates at the tympanum, from which it is separated by a membranous diaphragm, (*fenestra rotunda vel cochleæ.*) This deficiency of calcareous matter enables the sonorous vibrations of the *tympanum* to act more immediately on the tympanic tube of the *cochlea*.

The tympanic *scala*, and consequently the membranous tube which it contains, appear at first sight to be wanting in those birds and reptiles which are provided with a conoid *cochlea*. But their place is supplied with a cartilage in the form of a boot strap between the laminæ, on which the nerve is expanded, and by a membranous ampulla at the summit of the *cochlea*. In birds and reptiles, a space is observed around the cartilage, and between it and the bone, which on one side represents the *scala vestibuli*, and on the other the *scala tympani*.

In mammalia the two *scalæ* with their membranous laminæ make one, two, or three spiral turns round the axis, (*columella, modiolus*.) The calcareous lamella, (*lamina spiralis*,) which separates the two tubes, and forms by its presence the two *scalæ*, makes the same number of turns, as the tubes, round the axis to which it is fixed. The nerve of the *cochlea* enters by the base of the axis, and divides into numerous small filaments which issue from the axis, and radiate on the *lamina spiralis*. Thus the vibrations communicated to the *lamina spiralis* by the tubes are transmitted by these nerves to the sensorium The object of the peculiar form of the cochlea will be afterwards discussed.

2d. *Accessory or auxiliary parts of the organ of hearing.*—This consists of the tympanum and concha.

a. Tympanum.—In fishes, scarcely a rudiment of this is observed. In its most simple form it is merely a prolongation of the mucous membrane of the posterior fauces. This afterwards is found dilated at its distal extremity, forming a cavity of greater or less size and regularity, traversed by a chain of little bones. In some reptiles it is simply a bronchial sac, and in man himself, at an early period of fœtal life, the tympanum and Eustachian tube are mere prolongations of the respiratory passages.

The mucous membrane lining the tympanum is exceedingly delicate, in some instances as fine as a spider's web. Thickness would have prevented the due reflection of sound. Having lined the whole cavity of the tympanum, it is reflected over, and covers the parts traversing this cavity in the same manner as the *peritoneum* envelopes the abdominal viscera.

The osseous matter surrounding the labyrinth forms the internal wall of the tympanum, presenting on its surface two openings, (*fenestræ*,) to facilitate the transmission of sonorous vibrations. The external wall is formed of an osseous plate more or less arched with a circular or elliptical opening to receive the membrane of the *tympanum*. The mucous membrane covering these openings of the tympanum is to the ear what the parchment of the drum is to that instrument. The external opening over which the membrane of the tympanum is stretched is always larger than the *fenestræ.* All these openings are of course covered with the mucous membrane lining the cavity, and there is always a direct communication between that lining the membrane of the tympanum and that covering the *fenestra ovalis.* This takes place through the medium of a chain of bones, the *ossicula auditûs.*

b. *Ossicula auditus.*—In mammalia there are three or four, in birds two, and in some reptiles as many as three. In the Mammalia they are provided with two muscles, and in birds with one. Reptiles do not appear to have any muscular apparatus at this point. M. Breschet considers it erroneous to suppose, that four muscles connected with these bones exist in man, there being, according to him, only two, the *tensor* and *laxator tympani.* In birds the *tensor* alone exists.

The most external of these bones, called the *malleus*, is intimately connected with the *membrana tympani*, and in birds and reptiles appears to be identified with it. In these classes of animals it is cartilaginous or osteo-fibrous, while the internal part of the chain is truly osseous. One muscle is always inserted into the *malleus*, and that whether there be one or two connected with the internal ear.

The most internal of the *ossicula*, or the *stapes*, terminates always at the auditory bulb, through the medium of the *fenestra ovalis* and the membrane which closes it. This bone consists essentially of a plate or base occupying the fenestra just mentioned, from which in the *Mammalia* two branches or processes proceed, and only one in birds and reptiles. In the *Mammalia*, these two branches unite at a certain distance from the base, and in them alone is the base provided with a muscle (*laxator tympani.*)

In birds and most of the reptiles, the *malleus* and *stapes* unite so as to form a straight line or pillar of communication between the *membrana tympani* and the auditory bulb. In *mammalia*, again, they are connected by a third piece, the *incus.* The *os orbiculare vel lenticulare* is only an appendage of the *incus*, and in most quadrupeds they form one piece.

c. *Membrana tympani.*—This exists only in birds and *mammalia* in a thin tense vibrating state. It is the characteristic of aerial audition,[*] and in the Cetacea, the purely aquatic Mammalia, it begins to disappear, or is altogether incapable of being recognized. Externally it is concave in mammalia and convex in birds, and by this character alone these two classes of animals might be distinguished. The vibrations of this membrane produced by sonorous undulations are directly transmitted to the principal organ of hearing by the *ossicula*, and also to the air contained in the *tympanum*. The sonorous undulations reflected in the tympanum cause the membrane to vibrate longer, and thus the impressions are prolonged.

---

[*] We use this expression for the sake of brevity. If not elegant, it is at least short and intelligible.

The tympanum is of importance only when audition is aerial. In animals purely aquatic, and in the fœtus of superior animals, it is never filled with air. Fishes have no *tympanum*, and the fact of the *ossicula* and a thick cartilaginous *membrana tympani* existing in the Cetacea, can be looked upon only as a mark of their affinity to the higher animals. Their *tympanum*, besides, is filled with blood contained in a large *sinus*, and with a liquid apparently gelatinous. The tympanum then of an animal will enable us to detect the group, genus, and often even the species to which it belongs.

c. *External Ear or Concha.*—M. Breschet considers this to be a sort of ear-trumpet, a mere appendage placed before the membrane of the *tympanum*. It is peculiar to *mammalia* which have aerial audition. In some birds and reptiles two *labia* like the *palpebræ*, capable of being opened and shut, are observed, but these do not answer the purpose of the concha.

II. THE LABYRINTH OR INTERNAL EAR IN MAN AND OTHER MAMMALIA.—Under this head M. Breschet does not enter into a detailed description of the parts, but contents himself with considering those points which are most obscure.

It is important to bear in mind that the labyrinth consists of a very complicated osseous cavity, containing an extremely delicate membranous apparatus. The osseous cavity is the osseous labyrinth, the apparatus contained in it the membranous labyrinth. These two parts are frequently confounded, but very improperly, for unless they be considered separately, neither their structure nor their functions can be understood.

1. *Osseous Labyrinth.*—This contains the membranous labyrinth and the perilymph, which is placed between them. It consists of the semicircular canals, the vestibule, and the *cochlea*. In the subject all these cavities communicate with each other, and are moistened with the perilymph, or liquor of Cotugno. The two *scalæ* of the *cochlea* communicate with each other at their summit.

2. *Membranous Labyrinth.*—This is found only in the semicircular canals and a part of the vestibule, the *cochlea* being filled by perilymph. It does not occupy the whole of the cavities just mentioned, but floats as it were on the perilymph, and adheres to the osseous labyrinth only at those points where it receives nervous filaments. It consists of the semicircular tubes, the median sinus, and the sac, which have been already described in a general manner. Some minute circumstances, however, connected with them we now note.

a. ***Semicircular tubes, or semicircular membranous canals.*** —In each *ampulla* there is a slight nervous expansion, from which the tubes, however, receive no filaments. In the large chondropterygian fishes, in which the organ of hearing is very much developed, the nerve of each ampulla stops short as soon as it has reached its walls, does not expand, but resembles a little peg stuck in the part. M. Breschet has frequently seen it forming a sort of crescent or semilunar line, sometimes very slightly bent, and composed of several *lamellæ* superimposed on each other like the *retina* in may birds and fishes. In man, on the contrary, and several Mammalia which he examined, he found the nerves of the *ampullæ* to consist of a bundle of extremely delicate filaments, which expanded on these parts, and formed an elevation on their interior.

b. ***Median sinus; utricular sinus; Alveus utriculosus.***— This, which has been already so far described, occupies the superior part of the vestibule, and is of an oblong form, slightly compressed from within outwards, and directed from behind forwards. Inferiorly it adheres to the sac, superiorly it is prolonged in the form of a tube, which receives the unenlarged extremities of the anterior and posterior semicircular tubes. Anteriorly it is connected with the two anterior *ampullæ*, and posteriorly with the posterior *ampulla*, and the unenlarged extremity of the external semicircular tube. Though, as has been already observed, the median sinus does not adhere to the parietes of the vestibule, and the whole external surface is bathed by the perilymph, it is retained in its situation by the semicircular tubes and the nervous filaments, which penetrate it as soon as they reach the vestibule.

The median sinus, while occupying the superior part of the vestibule, is placed nearer the posterior part, from which it receives its nerves, than to the anterior. It has no connection with the base of the stapes, which is applied neither to it, nor to the sac, the sonorous vibrations being cammunicated by the agency of the membrane of the *fenestra ovalis*, and the liquor of Cotugno. or the perilymph.

The semicircular tubes and the median sinus are formed of thin transparent membrane, which possesses more consistency at the *ampullæ*. They are filled with a slightly albuminous limpid fluid. The fluid contained in the sinus communicates with that in the tubes. In the adult man the tubes are so narrow as to be truly capillary, and when cut the liquid does not flow out. In the fœtus they are proportionally larger, and when cut across the fluid escapes. The liquid contained in the sinus, sac, and tubes, is named by M. Breschet endolymph.

Within the median sinus, below and a little behind the place where the two anterior ampullæ are attached, a small mass of calcareous matter is found, which has never before been described, and which establishes another analogy between the ear of man and that of the inferior VERTEBRATA. It is more manifest in the fœtus than in the adult, and is distinguished by its glistening whiteness. Sometimes it is crystalline, and seems to be composed of carbonate of lime. Around this mass the nervous filaments appear to expand to receive the impressions which it may produce on them. When examined by the microscope, the particles of the mass are observed to be deposited on a lamina of soft and spongy tissue, which unites them so as to form a rounded or slightly elongated mass. The whole mass is about a quarter or half a line in diameter, floats in the endolymph or liquor contained in the sinus, and appears to be retained in its position by the nervous filaments which seem to be prolonged to it.

c. *Sac.*—The sac is a small rounded and slightly compressed membranous pouch, found under the median sinus, to which it adheres, and occupying the hemispherical *fossette* of the vestibule. Externally it extends to near the entrance of the *scalæ* of the vestibule, and internally it is firmly fixed to the osseous wall by the nervous filaments which perforate it. It adheres firmly to the median sinus; and M. Breschet is inclined to believe that these cavities communicate, though, from the extreme delicacy of the parts, he has not been able to ascertain the fact. The parietes of the sac, except where the nerves enter, are as fine and transparent as those of the median sinus.

The sac contains a fluid in which a calcareous mass floats,—around it the nerves are grouped. Both the fluid and the mass are the same as those found in the sinus. In the human ear, therefore, we find concretions in two places, as observed in the lower classes of the VERTEBRATA.

The sac, median sinus, and semicircular tubes, together with the very thin periosteum which adheres to the bone, are the only soft parts contained within the labyrinth. In *mammalia*, the *cochlea* contains no particular organ, while in birds a small mass of calcareous powder is found at its summit. In man it contains only the perilymph, which fills all the space not occupied by the parts already described; and as the *scala vestibuli* communicates freely with the vestibule, this fluid must communicate with that found in the vestibule and osseous semicircular canals surrounding the parts contained within them. The perilymph, therefore, occupies the greater part of the osseous labyrinth, and must be of great importance to the function of hearing.

The internal periosteum of the osseous labyrinth is extremely fine, and adheres firmly to the parietes. According to M. Breschet it exhales the perilymph. This tissue is more distinct in the young than in the adult, and is most developed where the aqueduct of the *cochlea* opens into the *scala tympani.* After covering the *scala tympani*, it is reflected at the summit of the *cochlea* into the *scala vestibuli*, whence it extends to line the vestibule and close the *fenestra ovalis.* From the vestibule it is reflected into the three osseous semicircular canals, where it performs the part of an internal periosteum.

III. Liquids contained in the Labyrinth.—After giving a historical and critical view of the opinions on this subject held by the various authors who have investigated it, from Valsalva to Fischer, for which, though interesting, we cannot make room, M. Breschet presents us with his own views. The two fluids conceived by him to exist in the labyrinth are, as we have already mentioned, the perilymph and the endolymph.

1. *Perilymph.*—We have already indicated the situation of this fluid. It is clear, watery, and slightly albuminous. Its quantity seems to increase as the animal rises in the scale of existence. In the Mammalia it occupies the greater part of the semicircular canals, and of the vestibule, and the whole of the *cochlea.* In birds the proportion is diminished, in consequence of the space between the membranous and osseous labyrinth being smaller than in the *Mammalia*, and the cochlea being reduced in volume, and filled by the cartilaginous partition. In reptiles the quantity is still less; and in some its existence is a matter of doubt, from the membranous labyrinth being almost closely applied to the osseous, so as scarcely to leave an interval for its reception. In fishes a peculiarity is observed. In most of these the auditory cavity communicates more or less freely with the cranial, whence it happens that the perilymph is not distinct from the encephalic fluid, or rather that the latter supplies its place; and as in most cases this is oily or gelatinous, the matter surrounding the membranous labyrinth is of the same nature. In a small number of fishes, some of the *cartilaginosi*, in which the cavity of the ear is perfectly distinct from that of the *cranium*, the perilymph is found in considerable quantity.

As the spaces in which the perilymph is contained communicate with each other, sonorous vibrations impressed on any portion of the fluid will be transmitted uniformly to all the rest, so that no one part will be affected more than another. This explains why the stapes is not in direct contact with the membranous labyrinth. If the contact had been direct, the vibrations transmitted by the chain of bones would have affected first and principally those points of the membranous labyrinth immediately in contact with the base of the *stapes*, while the other parts of the labyrinth would not have been impressed by them. With the aid, however, of the perilymph, they are spread uniformly over the whole cavity. This uniform distribution of the vibrations may be one condition of clear and precise hearing; and it is probable that hearing loses its exactness, and becomes more confused, in proportion as the quantity of the perilymph is diminished. The use of the portion contained in the cochlea can only be to communicate to the *lamina spiralis* the vibrations impressed on it.

2. *Endolymph.*—This fluid, filling completely the cavity of the membranous labyrinth, is as clear as crystal, but varies in density in different animals. In the Mammalia it is almost as limpid as water. In birds it is the same, with the exception that at the bottom of the cochlea it is more dense and glutinous. In reptiles it is thicker than water, and slightly viscid. In fishes it is quite viscid, especially in the *Chondropterygii*, where it frequently appears like jelly; and M. Breschet is of opinion, that its density in these animals is proportioned to the size of the organ. It is very viscid in the cephalopodous mollusca. The endolymph always contains one or more concretions, to which we have already alluded. Of the use of the disposition of the liquid in so complicated an apparatus he does not offer an explanation.

IV. Lithoid and Pulverulent Concretions found in the Labyrinth.—These were first discovered in fishes, and have been described by Casserio, Bromel, Klein, Geoffroy, Camper, Koelreuter, Monro, John Hunter, and more recently by Dumeril and Cuvier. In reptiles, too, they are mentioned as having been found. Comparetti and Scarpa seem to have observed them in man, but to have mistaken them for the dried pulp of the filaments of the auditory nerve. We shall give M. Breschet's account of them, omitting his bitter criticism on Geoffroy Saint Hilaire, of whom he speaks in terms by no means deserved.

According to our author, these concretions are found within the membranous labyrinth in every animal possessed of such a structure. They are seen in two different states; 1. under the form of a more or less connected mass of calcareous powder, extremely white and fine; 2. in the form of solid, frangible, very white, diaphanous, solid pieces, marked with a sort of fret-work, more or less elegant. The former he denominates otocones, the latter otoliths. The otocones are found in mammalia, birds, reptiles, the chondropterygian fishes with fixed *branchia*, and the cephalopodous *mollusca;* the otoliths in osseous and chondropterygian fishes with fixed branchia. They are composed of animal matter and carbonate of lime, with in some cases a small quantity of carbonate of magnesia. The use of these substances is conjectured by M. Breschet to be to communicate to the nervous filaments a more vivid impression than the endolymph could produce.

V. The Aqueducts.—After examining the various opinions entertained of these openings by different writers, M. Breschet comes to the conclusion, that they are merely canals for the passage of blood-vessels, indicating the mode in which the internal ear was developed. At first this organ was only a sac formed by the prolongation of the *dura mater*, and this view he considers to be borne out by the fact, that in many species of fishes the labyrinth is within the *cranium*. If in these animals the parietes were to be extended so as to separate the cavity of the labyrinth from that of the *cranium*, a small canal only would remain at last, establishing a communication between these cavities. This he considers is precisely what takes place in the developement of the human ear, and therefore these canals can have no influence on the function of audition in the adult.

We pass over M. Breschet's chapter on the differences in the labyrinth observed in different mammalia, as it would be impossible to give an intelligible view of the facts contained in it, without copying the views which he has given in illustration.

VI. THE COCHLEA.—M. Breschet conceives that all the descriptions of this part hitherto given are confused and deficient in accuracy and precision. His views are as follows. The *lamina spiralis* completely separates the two *scalæ* from each other, leaving no communication between them, except at the summit of the cochlea. It is fixed to the *modiolus* or axis, its internal portion being osseous, and its external or circumference membranous. The summit of the modiolus is confounded with the parietes of the *cochlea*, and the communication between the *scalæ* takes place at this point, in the form of a semicircular opening between the internal borders of the *lamina spiralis* and the axis. At this part the *modiolus*, instead of being cylindrical, forms a mere partition, and the *lamina spiralis* continuing its course ceases to correspond to it, and leaves the opening alluded to. What authors have described as the *infundibulum* is not a distinct cavity, but only the last turn of the *lamina spiralis* with the orifice of communication seen on cutting off a portion of the cochlea.

VII. ACOUSTIC NERVES.—When these are examined in animals, the internal ear of which is considerably developed, each labyrinth is found to have two nervous cords separated from each other, and arising separately from the *medulla oblongata*. These are the anterior and posterior auditory nerves. The former is distributed to the sinus and the anterior *ampulla*, the latter to the posterior *ampulla*, sac, and *cochlea*. These nerves have this peculiarity, that each of the very small filaments into which they divide, passes separately through a canal so fine as to be almost capillary, from which they issue to be immediately distributed to the part, to which they are destined. This distribution has the effect of rendering them more sensible. Where they terminate they always form an elevation.

We pass over the chapter on the physiology of the labyrinth, and that devoted to the views entertained by different authors regarding the communication of the cranium between the sympathetic and the encephalic nerves, and the formation of the plexus of the tympanum, as the substance of the former has been given above, and the consideration of the latter would lead us into a discussion foreign to the subject of this article. We shall therefore conclude this brief notice with a summary of M. Breschet's views regarding the plexus of the tympanum and the ganglion of Arnold.

In animals in which the tympanum is developed, as mammalia and birds, a nervous plexus described by Jacobsen, and known by his name, is found on the internal wall of the cavity. In reptiles this is represented by a simple anastomosing filament, which sometimes is observed in fishes also.

The plexus of the tympanum is connected with the ganglion of Arnold, the glossopharyngeal nerve, or its petrous ganglion, and the great sympathetic.

In the Mammalia the principal trunk of this plexus arises from the ganglion of Arnold, and the petrous ganglion, and its two portions may be considered as anastomosing in the middle of their course. The trunk is more slender at its middle than at its two extremities. Two filaments detached from it unite with the carotid plexus, and others still more slender lose themselves on the mucous membrane of the tympanum.

In birds the principal trunk proceeds always from the glossopharyngeal nerve and the superior cervical ganglion. At the middle of the tympanum it divides into two branches, one becoming continuous with the inferior maxillary nerve, and the other, after receiving a filament from the carotid plexus, being distributed to the posterior part of the mucous membrane.

In reptiles and fishes, where there are any traces of it, a filament proceeds from the fifth pair to unite with a branch of the glossopharyngeal.

The nervous plexus of the tympanum is sometimes contained in osseous canals situated in the internal wall of the *tympanum*, as in man and birds. These small canals contain also blood-vessels.

The use of this plexus M. Breschet reserves for another memoir.

The treatise of which we have given the foregoing account makes part of the fifth volume of the Memoirs of the Academy of Medicine in Paris; and the separate publication of the work cannot fail to be an acceptable present to the anatomical inquirer. It is proper to add, that it is accompanied with beautiful and distinct magnified figures of the parts.

Art. IV.—*Medico-Chirurgical Transactions, published by the Royal Medical and Chirurgical Society of London for* 1836. Vol. xx. 8vo. London, 1837.

Medico-Chirurgical Transactions. General Index to the first Eighteen Volumes. 8vo. London, 1836.

It affords us much pleasure to have occasion to notice, after no very distant interval, the 20th volume of the Transactions of this very respectable society. Its papers are less various than usual; being almost wholly confined to the subjects of medical and surgical pathology, in which there are five of the one, and nine of the other.

The first communication in the department of medical pathology is entitled *Observations on vascular appearances of mucous and serous membranes, as indicative of inflammation;* by John Yelloly, M. D., F. R. S.—In this paper, the author recapitulates the principles which he considers to have been established in a communication made by him to the Society some years since, and published in the 4th volume of their Transactions. He makes some additional observations on the same subject, and turns his attention particularly to the natural appearances of the spinal marrow, in which "a state of vascularity by no means morbid, has been sometimes regarded as imparting a certain character of spinal inflammation to some diseases of an obscure nature as tetanus, which did not actually belong to them."

In his former communication, the author afforded us, as objects of comparison, drawings of the appearances of vascularity exhibited in the stomach of persons who had no affection of that organ during life; and also of malefactors who were executed when in a state of health. In the present paper, he pursues the same course, and gives us drawings of the spinal marrow under the same respective circumstances; from which it is obvious, that mere vascularity, as a means of judging of the existence of inflammation during life, may often be as delusive in that organ, as in the stomach and alimentary canal.

We have had occasion, more than once, to express our surprise at the want of information evinced by many continental physicians, as to what was going on in this country, and the absence of any acknowledgement of Dr Yelloly's previous and well established observations on the appearances of mucous and serous membranes, when such gentlemen were treating of the same subject. The author has himself, indeed, touched upon this point; and has offered some forcible and just remarks on the necessity of reciprocation, in conducting scientific inquiries in different countries.

"In adverting to the present state of pathological opinions relating to vascularity, it is particularly satisfactory to me to find, that there is so much accordance between my own conclusions, and those which have been arrived at by gentlemen, who have availed themselves, so sedulously, of the ample field of pathological investigation which they possess in a neighbouring kingdom. It would have saved them, however, much labour, and perhaps, to a certain degree have modified some of their deductions, had they been so far acquainted with our Transactions, as to have known what had been done in this country on the same subject. Life is, indeed, too short, and the difficulties which attend the prosecution of philosophical inquiries too considerable, to afford that there should be no division of labour in science; and that men of talents and energy should occupy themselves in investigations which have already been prosecuted in other quarters, without being aware of what has already been done on the same subject. Science is common property, of which every one may avail himself at his pleasure; but the talents of able men belong also in a certain degree to the public; and it is a species of duty for such as are qualified, by their abilities and industry, to enlarge the boundaries of science, to employ themselves in the most provident manner possible for the common benefit."—Pp. 26, 27.

The author points out some want of precision occasionally exhibited by distinguished continental authors, and even by Andral himself, in treating of the phenomena of inflammation; and he mentions several difficulties, which exist, in the present state of our knowledge, as to a proper appreciation of the peculiar local circumstances on which such phenomena depend.

The second paper in medical pathology contains *remarks on two forms of atrophy of the heart's valves, which interfere with their functions; founded on a series of cases*; by Peter Nugent Kingston, M. D.

The author, five years ago, had occasion to observe the peculiarities which form the subject of this communication, and his observations have since been confirmed by several more cases. These peculiarities consist either in a shortening of the mitral and tricuspid valves, without any diminution of their natural thinness, pliancy, and transparency; or in the continuity of the valve being affected by apertures, which reduce its structure to a mere net-work, while the remainder is in a state of great attenuation. Among thirty fatal cases of diseased valves, in ten one or other of these species of atrophy existed. The mitral valve was shortened in five of this number; the tricuspid in as many; and both of these in two; while in one, the mitral valve was cribriform or perforated like a sieve; in two, the tricuspid, and in one, both the aortic and pulmonary valves were in the same state.

These defects in structure have necessarily a tendency to prevent the closing of the orifices of valves, and therefore lead to the production of dilatation or hypertrophy of the cavities behind them, together with palpitation, venous congestion, anasarca, and effusion within the cavities of the serous membranes; and, where the mitral or aortic valves are defective, to dyspnœa, cough, and pulmonary congestion.

In the latter case, the radial pulse and precordial impulse were frequently irregular and unequal. When the defect lay in the mitral valve, the pulse at the wrist was generally small and weak, compared with the beat at the heart; when in the tricuspid, there was distension, sometimes attended with pulsation of the external jugular veins. A bellows-like sound is often produced by the reflux of blood through the affected valve.

With regard to the cause of such valvular affections, the author considers them as hardly ever congenital; but as arising from a species of absorption operating on the valves independently of suppuration. They generally occur in persons exercising laborious occupations; and as in this case the blood's impulse against the valve affected is increased, the pressure to which it is in this way subject may, the author is of opinion, have a considerable effect in producing the absorption necessary to occasion the changes described. He gives many examples of the effects of pressure in producing absorption; but he is of opinion, that the undue force of sanguineous impulse is not alone sufficient to the object, since this sometimes gives rise to a slight augmentation of thickness;—and that a certain degree of debility in the nutritive powers of the valves is also necessary, by means of which nutrition is obstructed by a degree of pressure, which, had the organ been sufficiently vigorous, it would have been able to withstand. When the valves obtain an accession of bulk by increased pressure, it seems to the author to be analogous to the usual effects of increased exertion in a healthy part.

The cribriform appearance of the valves, the author is disposed to refer to the effects of local debility often consequent on gouty or rheumatic action.

In the treatment of valvular disease, such as forms the subject of this paper, the most important object is to avoid great muscular exertion, and thus to prevent the supervention of hypertrophy and dilatation; but a good deal of very gentle exercise, by determining the blood to the remote parts, and relieving the heart and great vessels of their distension, is often highly beneficial. By careful management, the author thinks it not improbable, that the orifice and cavities to which the defective valve belongs, may gradually diminish their calibre, so as to become adapted to the altered size of the valve, and thus perhaps the valve itself may be restored to its original dimensions.

The next communication treats *of inflammation, chronic disease, and perforative ulceration of the cæcum, and of the* *appendix vermiformis cœci, with symptomatic peritonitis and fecal abscess;* by John Burne, M.D.—The author's attention was directed to the class of affections which forms the subject of this communication, sixteen years since, by the case of a young lady, " who had became suddenly ill with obstinate constipation of the bowels and vomiting, accompanied by febrile movement, and local symptoms centered in the right ileo-inguinal region."

He was disposed to refer her symptoms to an inflammation of the cœcum, arising probably from the lodgement in it of some indigested substance, as fruit; and he has since met with about twenty instances of a similar description, which, with the pathological characters which he was enabled to ascertain in respect to some of them, are, he thinks, sufficient to warrant him in forming the general conclusions, which he now lays before the Society. The disease is ushered in by a sense of uneasiness in the right ileo-inguinal region, coming on suddenly and unexpectedly, and not preceded by rigor. This soon amounts to aching pain, which increases progressively for twelve or twenty-four hours, and is followed by tenderness, fulness, and tension, the bowels being constipated and the patient growing sick and vomiting. Febrile irritation soon comes on, and after the lapse of some days, an *exquisite tenderness* exhibits itself in the abdominal parietes covering the cœcum, which far exceeds that which occurs in enteritis or in inflammation of the peritonæum. The constipation continues, but the vomiting does not become frequent and distressing, as in enteritis; nor does the face betray so soon an aspect of anxiety. If purgatives and blood-letting do not remove the symptoms, the patient sinks in seven or eight days from exhaustion; or if life is further prolonged, there may appear about the tenth day a circumscribed emphysematous tumour, which will prove to be a fecal abscess making its way by ulceration to the surface of the body, and depending on the adhesions by which the peritonæum may be secured, for the ultimate safety of the patient. If the abscess make its way backwards, it will reach the outer edge of the *quadratus lumbrum*, and perhaps the patient do well.

With regard to the treatment, abstraction of blood must be employed with caution, and very much confined to the use of leeches; but purgatives, particularly the milder kind, and *enemata*, are the principal curative remedies; for if the cœcum is not sufficiently emptied, the formation of an ileo-inguinal or lumbar tumour must be inevitable, which must be encouraged by poultices, and in proper time freely opened, when the support of the patient's strength by adequate means becomes the only remaining subject of attention.

The free communication of the *appendix vermiformis* with the cœcum, renders the former liable to the accidental intrusion of various substances; and it is difficult to say whether it has any power of expelling them. The introduction of such substances is often innocuous; but it may be the source of much irritation, and sometimes even of fatal consequences, when it gives rise to ulceration, and when that goes on so as to affect the peritonæum.

The author gives, in support of his views and opinions, a narrative of several illustrative cases, which will be read with interest.

The fourth paper in medical pathology is *On black expectoration, and the deposition of black matter in the Lungs, particularly as occurring in coal-miners, &c.* by W. Thomson, M. D. —The subject of this paper is one which has been long the object of attention by the author, as well as his distinguished father, Dr Thomson of Edinburgh. The presence within the body of substances not belonging to its natural constitution has been accounted for on the supposition, that they have been separated from the mass of circulating blood by secretion; that they have been discharged from blood-vessels by percolation or rupture; or that they have been introduced from without, either by natural or artificial passages. The frequent discoloration of sputa during life, and the detection of black matter in the lungs and bronchial glands after death, has led to a supposition, that in many instances these appearances depend on the introduction of foreign substances into the respiratory organs by inhalation; and the author, in the present investigation, is desirous, in particular, to call professional attention to the evidence in favour of this extraneous origin.

In prosecuting the subject, he first gives a detail of individual cases which have come under his knowledge; and then lays before the Society various communications from gentlemen who have had extensive opportunities of observation on the subject of his inquiry.

There are ten examples of cases with black expectoration in which there were symptoms of pulmonary affection during life; nine of them occurring in persons engaged in coal mines, and one in a moulder employed at the Carron Works. Among this first series of cases, Dr Thomson arranges that described in the thirty-second volume (p. 389) of this Journal, by the late James Crawfurd Gregory, and that recorded by Dr G. Hamilton in our forty-second volume (p. 297.) Of cases in which black infiltration was found after death, though neither black expectoration nor pulmonary ailment had been observed during life, there are six in number, three of which were published in the forty-second volume of this Journal by Mr Graham, now Professor of Chemistry in the London University College; and to them may be added the case in which the first specimen of black lung seen by the author occur-

red, the appearances of which are given in Dr Carswell's article on melanosis, in the Cyclopædia of Practical Medicine.

It is likewise stated by the author, in addition to the evidence on this part of the inquiry, that Professor Thomson, his father, in the summer of 1833, learned from Professor Schoenlein of Zurich, that he had seen several cases of black infiltration of the lungs in miners, where no gunpowder was employed in the mines in which they worked, that might be supposed to give rise to the appearances in question.

In addition to the facts communicated by the author relative to the preceding heads of inquiry, he communicates several cases in which black sputa had been observed during life, but in which there had been no opportunity of examining the state of the lungs after death. He likewise gives, from medical men practising in various coal districts in Scotland, some interesting letters on the circumstances under which black expectoration takes place among workmen in coal-pits; among which we must mention, as deserving of especial attention, the communications of Dr Dewar of Dunfermline, Mr Philp of Aberdour, Mr Steele of Craighall, and Mr Stevenson of Gilmerton; and, lastly, he annexes a copy of the queries which he circulated, for the purpose of obtaining the information which he solicited.

From these communications, it appears, that pulmonary consumption and black spitting are very common among persons employed in coal mines; and that they are referred by some to impurity of air, and others, to that peculiar sort of vitiation which is connected with what is called stone work, particularly when gunpowder is employed for the purpose of blasting; though, with regard to the latter point, there is some difference.

The foregoing constitutes the first part of the paper, which is all that is yet published.

The last paper in medical pathology contains ***Researches on some points of the Pathology of Pulmonary Tubercles;*** by Peter Nugent Kingston, M. D.—The object of the author in this communication is to show, "*1st*, That the common pulmonary tubercle is a vascular texture; *2dly*, that it sometimes originates in an alteration of the air-cells and their secretions; and, *3dly*, that now and then it is entirely healed, when it has even extended over a very large portion of the lungs."

With regard to the *first* point, the author does not consider the evidence in favour of the non-vascularity of tubercles at all conclusive; for if we were even in possession of means of reaching, by injection, the nice vascularity of delicately organized parts, it does not appear to him that the process adopted for the purpose has been adequate; for the injection should, he thinks, have been thrown in by the bronchial arteries, instead of the pulmonary arteries and veins. That vessels, however, do exist in tubercles he is satisfied, by the observation of many of them of the ordinary kind, which exist in patients unequivocally phthisical, exhibiting a distinct transversement by red vessels penetrating their whole surface.

Relative to the *second* point, though there is much difference of opinion on the subject, many authors considering tubercles as existing in the cellular texture of the lungs, Dr Kingston considers the origin to be accomplished, in the first instance, by a thickening and distension of the air-cells by morbid mucus. Their parietes go on thickening, "and their contents gradually solidify, till at last a total obliteration of their cavity is effected, and then result a number of solid white or gray, more or less opaque, bodies, frequently of rounded form, such as have received the appellation of miliary tubercles, and miliary granulations."

This doctrine accords in its essential characters with that already propounded on the origin of tubercular deposition, by M. Schroeder van der Kolk and Dr Carswell.

With regard to the *third* point, the author does not suppose that the alteration of the air-cells, with which the formation of tubercles commences, invariably pursues a fatal course; for though the state of the constitution may sometimes be such as to render abortive all attempts to remove the affection, or to check its tendency to degenerate into tubercles and vomicæ, there are cases in which the parts regain their natural condition. In proof of this, the author gives the history of a man of 49, who was four months in St George's Hospital for a wound in the calf of his right leg, from the kick of a horse, during which time he exhibited no symptom or suspicion of breast-disease. Soon after his discharge he was exposed to a drenching rain, and was brought again to the hospital, with pain in the loins and hypogastrium, and suppression of urine. Five days afterwards, there supervened severe headach, delirium, ptosis, and strabismus of the right eye, with dilatation of the pupil; and he died on the twelfth day of the attack, having never coughed during that time, nor made any complaint of his chest. On examination the kidneys were found to be inflamed, the mucous membrane of the bladder congested and thickened, and the prostate gland to contain lymph and pus. In addition to these appearances, however, which may be regarded as the cause of death, the whole of one lung and a quarter of the other were found to be incapacitated for their functions. The left lung was not larger than a moderate-sized flattened orange, and it was united to the ribs and pericardium by tough net-work, containing a layer of fat, of from half an inch to three-quarters in thickness, while the whole of the upper, and part of the lower lobe was covered with a thick, reddish, ligamentous membrane. The lung had totally lost its sponginess, and was irregularly hard. In both lobes were excavations, in which the open mouths of some bronchi, which had the appearance of being cut off, were apparent. Some of these excavations contained the residue of old tuberculous secretions, of which the fluid particles had been absorbed. The right lung was larger than usual, and contained no excavations. About three-fourths of it were perfectly healthy; the remainder made of solid masses, varying in size from a mustard-seed to a filbert. A small one had the aspect of being contained in the thickened dilated extremity of a bronchus; and many were of a carious consistence, or were made up of hard black granules, or consisted of capsules filled with matter of different appearances.

The state of the lungs as now given, and as presented by the author in considerably more detail, afford to him a fair and reasonable presumption, that the matter of tubercles is sometimes absorbed, or becomes incapable of exciting irritation.

The first of the papers in surgical pathology contains the *History of a remarkable case of Varicose Aneurism, with Observations;* by John George Perry.—It has hitherto been considered by the most eminent surgeons who have treated of this disease, that a wound of the vessel, by some penetrating instrument, is a necessary prelude to that intervascular transfusion which constitutes its peculiar character; but from the case now described the author is disposed to regard the conclusion which has been come to on this subject as not quite of universal application. A man of 47, who had been a dragoon in early life, and had never suffered any local injury, except a blow on the knee by the fall of a heavy piece of timber many years previously, from the effects of which he never completely recovered, was attacked, when employed in drawing a truck in 1831, with a pain in the foot, which suppurated, and produced much inconvenience to him for several months. Soon afterwards, a swelling appeared under the left knee, which in two years became pulsating, and in February 1834 exhibited itself as an aneurismal tumour of considerable size, at the upper and inner side of the calf of the left leg, apparently occupying the lower end of the popliteal, and commencement of the posterior tibial artery. In addition to the pulsation of the tumour itself, a peculiar sort of pulsation or purring could be both seen and felt along the course of the femoral artery and vein in the upper two-thirds of the thigh, terminating where the vessels are included in the tendinous sheath of the triceps; but on pressing the finger on a part of the artery, just before entering the triceps, the purring was stopt, without, however, interrupting the circulation through the vessel. A communication was in consequence of this circumstance suspected to exist at this place between the artery and the vein; but there was no reason to suppose that the patient had ever suffered any wound in that part of the body, from which the communication might be imagined to originate.

It was not considered that any operation for the patient's relief was justifiable; but about two years afterwards, in consequence of the sudden increase of the tumour, and the livid appearance of the skin, which threatened a speedy loss of life by hemorrhage, it was determined to pass a ligature round the popliteal artery, which was done about half an inch higher than the usual place. The artery was as large as the abdominal aorta, and so attenuated and fragile, as to endanger its complete division by not more than the ordinary force. On the fifth day after the operation, hemorrhage suddenly occurred, and produced syncope; and on the following day, a repetition of it carried the patient off. The lungs and pericardium were respectively adherent to the costal pleura and heart. The right auricle was large, right ventricle small, left ventricle dilated, and the valves healthy. The arch of the aorta was thin and dilated, and had a deposition of much atheromatous matter on its inner coat. The abdominal aorta was rather thin in its coats, and the femoral artery was not thicker than a vein.

Immediately below the *profunda*, the artery was so much dilated as to have the appearance of an aneurismal sac; and a little lower, an opening was found in it, large enough to admit the point of the ring-finger, from which the fatal hemorrhage occurred. At the place where a communication was presumed to exist between the artery and vein, an aneurismal sac was formed of the size of a walnut, and firmly ossified within, which, by the pressure it had exercised on the vein, had caused an absorption of its coats, so as to form a circular opening of about two lines in diameter, into which the aneurism had burst, thus inducing a free and persistent communication between the vessels.

The second paper in the department of surgical pathology gives a *case of a recovery from the insensibility of intoxication, by the performance of tracheotomy*; by George Samson, Esq.—A man of 31, completely insensible from the use of large quantities of spirits, much of which was removed by the stomach pump, was likely to be carried off by coma, in consequence, as the author imagined, of the brain being supplied by blood not sufficiently oxygenated. Tracheotomy was performed, which removed the distension of the veins of the head and neck, and soon brought about regular and easy respiration. In three weeks the wound was healed, and the patient was discharged cured.

The next communication is *on the treatment of injuries received in dissection*; by R. A. Stafford, Esq.—Six interesting examples of the disease are given, from which the author infers, that when signs of absorption have taken place, which will be known by the pain and inflammation of the wound; and whether the absorbents are inflamed or not, it is important to rub *Argen-*

tum Nitratum on the cuticle, across the course of the absorbents about two inches in breadth. The bowels should be freely opened; local swelling and pain reduced by leeches; fomentations and poultices applied; and muriate of morphia given to allay irritation. General bleeding is seldom necessary, and sometimes injurious; but the repeated application of leeches to the inflamed parts is very advantageous; as are incisions freely and early made. When abscesses are discharging profusely, and the patient is reduced by the violence of the disease, constitutional power and support are urgently required.

The fourth paper in surgical pathology communicates an *Account of a case of fracture and displacement of the Atlas*; by Benjamin Phillips, Esq. F. R. S.—A man of 32, had a fall headforemost from a stack, but was able to walk half a mile to the parish doctor. He was sufficiently recovered by bleeding and purging to resume his work in two days; but he continued to have a stiff-neck, and in about a month after the accident, a small tumour over the second cervical vertebra was apparent, which was slightly tender, but did not impede rotation. Repeated leeching did little good; nor was the patient benefited by a long-continued drain from issues. Thickness of the voice soon exhibited itself, and slight inconvenience in swallowing, when a fulness at the back of the pharynx was discernible, nearly on a level with the body of the second cervical vertebra. He then had an attack of pleuritis, from which he was recovered at about the period of thirty-three weeks from the original accident. In about a month more he was attacked with anasarca, which terminated in hydrothorax, of which he died in the forty-seventh week from the accident. On examination, there was found to be a fracture and displacement not only of the atlas, but of the *processus dentatus* likewise, without any material disturbance of the functions of the animal economy. The condyles of the occiput still rested on the articulating surfaces of the atlas; but the anterior part of the latter, including the place of articulation with the occipital condyles, and with the *processus dentatus*, were separated from the posterior portion of the rim, and firmly attached to the body and transverse processes of the axis; the *processus dentatus* being fractured and separated. From this case there appears to the author to be good "reason for rescinding the dicta, that a fracture of the *processus dentatus* proves instantly fatal;" and "that a fracture of the cervical vertebra above the third is almost immediately so."

The fifth paper gives *a case of unusual dislocation of the thigh bone, with observations*; by Benjamin Travers Jun.—In this case, a sailor, aged 19, fell from a height of about 20 feet, into the hold of vessel, on the left buttock, and after a lapse of eight months, when he was seen by the author, the following was the state of the parts. "The left buttock is flattened; the trochanter is left rather below and to the outer side of the anterior and superior spinous process of the ilium. The neck of the bone lies apparently between the two anterior spinous processes, so that, when the patient is erect, the limb appears slung or suspended from this point. The head of the bone cannot be felt; it is invested by an abundance of bony matter, which extends backwards and inwards over the brim of the pelvis and iliac vessels, occupying in front, nearly the whole space between the inferior spine of the ilium and that of the pubis respectively. There is complete eversion, slight mobility, and imperfect progression with the aid of a crutch." P. 113.

The sixth paper is entitled *Pathological and surgical observations relating to injuries of the spinal chord;* by Sir Benjamin C. Brodie, Bart. F. R. S.—The analogy which exists between the structure and functions of the spinal chord and those of the brain have induced surgical authors to attend less to the consequences of wounds and contusions on the former than the latter; and this defect it is the author's object to supply by the present communication, which is principally made up of observations supported by the authority of written reports of cases which have occurred in his public or private practice during the last few years. Penetrating wounds into the spinal cord are almost invariably fatal at a very early period; and on this subject the author, therefore, does not think it necessary to dwell, but goes on to the enumeration of the various more common varieties of injury of the vertebral column. These he classes under the heads of, 1*st*, fractures of the vertebræ, without displacement of the fractured surface; 2*d*, fractures with depression of bone, occasioning pressure on the spinal chord; 3*d*, fractures complicated with dislocation; 4*th*, dislocations not complicated with fractures, the existence of which class has been doubted by some very distinguished surgeons; 5*th*, extravasation of blood on the surface of the spinal chord; or 6*th*, narrow clots of blood discovered within its substance; 7*th*, laceration of the spinal cord and its membranes; 8*th*, injury to the minute organization of the spinal column by a blow, when there is neither fracture nor dislocation; such a species of injury often leading to disorganization, softening and final dissolution of its substance.

With regard to concussion of the brain, there may be, as the author has stated in a former communication, organic injury produced which the senses are unable to detect; and the same may take place in the spinal column and to a greater extent, since the cord and its membranes occupy only a part of the vertebral column, while the brain and its appendages completely fill the cavity of the cranium.

The author is not of opinion that the process of softening and dissolution is connected with inflammation; for the softening takes place before symptoms of inflammation exhibit themselves, and may be unaccompanied by increased vascularity, or other indications of inflammatory action, either at an early or more advanced period. Even the occurrence of inflammatory appearances during the progress or at an advanced period of disease is no proof of their having had any previous operation as a cause.

Appearances of enlargement in small vessels may occur likewise in the course of a disease, without having any thing to do with the cause of it. The symptoms arising from injuries to the spine may be inferred to concussion of the chord; to laceration or division of its substance; or to pressure made on it, either by extravasated blood, or displaced bone. One of the most usual of them is *paralysis* of the voluntary muscles below the seat of the injury. This may be various in its degree and extent, may affect one limb and not another, or certain muscles of the same limb only, leaving others untouched. *Paraplegia* is more common than paralysis of the upper limbs; but no case is stated in which the injury was so far confined as to produce hemiplegia only. Paralysis after injuries of the spine is always of a dangerous character, but still many people recover from it. Complete division of the spinal chord has been described by some authors as having taken place without the production of paralysis; but Sir Benjamin very properly considers it as much more likely, that the examination has been so careless or insufficient, than that so remarkable a deviation should take place from the usual course of events.

Muscular spasms are sometimes the result of injuries to the spinal column, probably arising from a slight degree of pressure by extravasation of blood on that organ. The *nerves of sensation* are variously affected. If the injury be in the situation of the sixth or seventh cervical vertebra, the destruction of sensibility is frequently partial in the upper extremities, while it is complete in the trunk and lower extremities; but if it correspond with the fourth or fifth vertebra, the patient, during the short remaining period of life, presents the extraordinary phenomenon of a living head, with its sensibility and muscular powers unimpaired, attached to a trunk and extremities, of the existence of which he is totally unconscious. When the division takes place above the origin of the phrenic nerves, nervous influence is no longer transmitted to the diaphragm and other muscles of respiration; and the animal perishes in the same manner as from strangulation. Sometimes it may happen that the intercostal muscles may have their nervous energy interrupted, and the patient may breathe by the diaphragm alone, being unable to expectorate mucus. *Priapism* sometimes occurs, whether from concussion or pressure;

but it is connected more with injuries of the upper than the lower portion of the cord. It may take place even when sensibility is so far destroyed as that the patient is unconscious of the operation of passing the catheter. Inability to pass the urine is often the effect of injuries of the spine, as are occasionally a diminished secretion of that fluid, and some curious changes which the author mentions in its composition. Torpid bowels, incontinence of feces, and evacuations of a black colour, are not unfrequent attendants on injuries of the spine; but one of the extraordinary circumstances connected with them is the great increase of temperature, which, in a case which occurred at St George's Hospital, of a forcible separation of the fifth and sixth cervical vertebræ, attended with effusion in the theca, and laceration of the medulla, the thermometer between the scrotum and thigh rose to 111° of Fahrenheit a little time before the patient's death, which took place twenty-two hours after the accident, when there were not more than five or six inspirations in a minute. *Gangrene* is sometimes a consequence of injuries of the spine, and in this case it is limited to the parts which are below the seat of such injury.

The *sensorium* was seldom found by the author to be affected, except when the injury was in the cervical part of the spinal cord, and then the results were very different in different cases. The first effect of a severe injury of the cord is to produce a state of depression and collapse, by lessening the force of the heart's action. Inflammation of the membranes of the cord much seldomer occur after injuries of the spine than of those of the brain, where the head has been affected; but Sir Charles Bell describes two cases in which inflammation and suppuration occurred in those membranes from injury to the spinal column. There seems to Sir Benjamin Brodie to be no material difference in the symptoms which arise from compression or laceration; and he is of opinion that the great majority of the symptoms are the same, whatever part of the spinal cord may have been injured, except as far as the state of respiration is concerned, when the injury has been above or below the phrenic nerves.

With regard to the *treatment* of injuries of the spine, they come less under consideration in the present communication, as the principal object of the author, in preparing it, was to analyse and arrange the pathological phenomena. Reduction may be attempted if dislocation has occurred in the lower part of the spine; but there are hardly any cases in which the author thinks that the application of the trephine, according to the suggestion of the late Mr Henry Cline, is at all admissible. In the majority of cases, blood-letting is contraindicated.

The sixth paper on surgical pathology consists of *Observa-*

tions on some tumours of the Mouth and Jaws; by Robert Liston, Esq.—Many of the diseases of this region are beyond the reach of surgical aid; and the author therefore considers it as a point in which humanity is materially concerned, not to perform any operation without a fair presumption, and strong probability of ultimate success. The mouth is the seat of tumours of various consistence, structure, and disposition. The characters of the *parulis* and *spina ventosa* of the jaw are noticed by the author as being capable of surgical treatment by extirpation. There is a disease likewise of which many specimens are to be seen in collections, in which a soft vascular growth arises from the apex or side of the fang, which increases to a considerable magnitude, assuming a fungous nature, displacing the teeth, and involving the contiguous parts in its structure.

In the upper jaw, the irritation of decayed teeth often produces morbid growths, which affect the maxillary *antrum* and neighbouring parts, and assume in time the appearances to which the term of osteo-sarcoma has been often applied. These growths are sometimes of an encephaloid character; but in the *antrum* itself tumours composed of erectile tissue occasionally exhibit themselves. In the upper jaw are sometimes seen tumours, which commence in the osseous structure and periosteum, and are of a more simple and manageable character than those previously noticed. Extensive deposits of osseous matter are also occasionally found in the cavities and fossæ of these bones; as are likewise tumours of a fibrous or fibrinous nature, which are very generally attributable to some external injury. Affections of the lower jaw are in general of a more mild and tractable character than those of the upper.

After describing the progress of the simple tumour of both the upper and lower jaws, the author informs us, that of fifteen cases which have been published, in which the whole or the greater part of the superior maxilla has been extirpated, eleven died either from the effects of the operation, or a return of the disease. The author has met with many cases within the last fifteen years, which were of a character that he did not think himself justified in operating upon them; but he presents to us in this paper an account of several cases of the simple or fibro-cartilaginous tumour, in which he performed operations successfully, though there was one in which the termination was unfavourable These operations are highly creditable to Mr Liston's intrepidity and skill; and an interesting engraving is given of the appearance of one of the cases (the fourth) before and after the operation. In this case, the patient, a female of twenty-one, from Hull, after suffering two operations for a tumour in the left superior maxilla, put herself under Mr Liston's care, in consequence of a fresh growth. When he saw it, it had acquired the size of a moderate sized cocoa-nut, causing great deformity.

" The mouth, it is stated, is drawn to one side, and the vision of the left eye partly obstructed. She complains of very little pain, and her general health is good. The swelling is of firm consistence, and appears to involve the whole of the superior maxillary bone; internally it occupies the whole of the palate, but is unattached on the right side; a probe can be passed under it for some distance. It extends as far back as the finger can reach, and projects over the velum, concealing a great part of it The patient came to town expressly to have the tumour removed, and on Saturday, the 27th February 1836, the operation was performed.

" After removing the central incisor of the left or opposite side, which was rendered necessary by the extent of the tumour, Mr Liston commenced an incision a little below the inner angle of the eye, and carried it obliquely under the corresponding ala of the nose, detaching its cartilage from the bone, then through the lip into the mouth, in the mesial line. An incision was next made from the prominence of the cheek to the angle of the mouth. The flap thus formed was reflected upwards. The tumour, it was now ascertained, extended considerably backwards, and it was necessary to make another incision, nearly at right angles, on the outer perpendicular one, in the line of the zygomatic arch; the tumour was thus exposed throughout its whole extent. With strong cutting forceps the nasal process of the superior maxilla was divided; the operator next cut through the zygomatic arch, near the auricle, and then through the malar bone at the transverse facial suture into the spheno-maxillary fissure; the diseased maxilla was separated with great facility from its fellow of the opposite side, by strong scissors, leaving the palatine plate of the palate bone and *velum palati* entire and untouched; the superior maxillary nerve was carefully divided. The diseased mass was now readily removed, involving the whole of the superior maxillary bone, the whole of the malar inferior spongy bone, and the zygomatic process of the temporal bone. The internal maxillary artery, which bled not very freely, was immediately tied, and the edges of the flap brought together by five points of twisted and two of interrupted suture. The whole proceeding occupied under six minutes. The tumour was of a firm fibrous structure, interspersed with spiculæ of bone, perfectly entire. Not the least particle of diseased structure could possibly be left behind, as the tumour came out unbroken and surrounded by cellular cyst. The wound was completely healed, and the tumefaction almost gone, on the 26th March; she was in good health and spirits, and the cheek on which the operation was performed looked nearly as well as the other: she has not had one bad symptom, and the space occupied by the diseased mass has gradually decreased in size. She soon returned home, and by a report from Hull of the subsequent 31st of May, she was going on most favourably."—Pp. 190–192.

The next paper gives the ***Sequel of a case, in which the external Iliac Artery was tied, with an account of the condition of the blood-vessels in the limb after death;*** by G. Norman, Esq.—The subject of this case, (which is given at p. 95, Vol. x. of the Society's Transactions,) continued free from any aneurismal disease from the time of the operation, which was performed in September 1813, till that of his death, which took place by an attack of Asiatic cholera on the 2d of February 1834. Independently of the appearances in the alimentary canal, which were characteristic of cholera, there was found to be some thickening and dilatation of the left ventricle of the heart, with depositions of bone in the mitral valve. The arch of the aorta was somewhat dilated, and presented several patches of ossific deposit. The arteries of the right lower extremity were filled with injection to their extreme branches; and on examination, the external iliac vein was found to be as usual, but the artery was obliterated, "from the bifurcation of the common iliac, to a point corresponding nearly to the lower edge of Poupart's ligament, and about one-eighth of an inch above the origins of the epigastric, and *circumflexa illii* arteries; it then again became pervious, and of equal size with the vessel in the opposite limb. The cord occupying the place of the obliterated vessel was of considerable size; the arterial coats perfectly distinct; and a probe introduced into its centre readily separated the adherent surfaces of the internal coat until it reached a point about an inch above Poupart's ligament, when all traces of the natural textures were lost, and replaced by a dense fibrous bundle." The first part of the profunda and external circumflex arteries was obliterated. The lateral circulation was mainly carried on by the ramifications of the internal iliac artery, which was nearly as large as the femoral. The author traces the anastomoses to the ilio-lumbar artery, and to the obturator, the gluteal, the ischiatic, and the internal pudendal arteries.

The eighth paper in surgical pathology contains ***Observations on some of the forms of Atrophy of Bones;*** by Thomas Blizard Curling, Esq.—Pressure and friction may produce that absorption of bony structure on which atrophy depends. Bones likewise, as well as the soft structures, may waste away when their activity is diminished, or their functions suspended, as in stumps after amputation, and in anchylosed limbs. The same may likewise happen to bones, "in common with other tissues," when deprived of nervous influence by paralysis; but the author has not observed that a diminished supply of blood will have such an effect on them, though it will on some other structures of the body, as the kidney and thryoid gland. It appears to the author, however, that in fractures below the entrance of the nutritious or medullary artery, there will be likely to be a defect in the production of ossific matter in the inferior portion of the limb; because the minute canals through which the external or periosteal vessels pass, being of a dense unyielding nature, will prevent the vessels passing through them from undergoing that rapid increase of size, which is necessary to make up, (as in soft parts,) for the diminished circulation produced by the division of the medullary artery. He thinks likewise that the same would happen in respect to the upper portion, where the division took place above the entrance of this artery; and he has found that his suspicions were confirmed as well by the result of his own observations, as by the inspection of several anatomical collections in London. In these cases, he found the interior cavity of the fractured extremity enlarged, whether lower or upper, as the case might be; the cancelli expanded, and the walls thinned, and he therefore considers this form of atrophy as fitly entitled to the denomination of the *eccentric*. That this description of the complaint does not constantly appear, the author considers as sufficiently accounted for, by the greater activity of circulation, and less density of the canals in growing bones, and the variation in the distribution and number of the nutritious vessels in others. In old persons, and in those of weak powers, the circulation may never be completely reinstated, and the atrophy will therefore be permanent; whereas in the healthy and vigorous, the regular circulation will be supplied, so as to prevent the effects of the incipient atrophy being manifest.

The author next makes some remarks on fractures of the head of the thigh bone, and on the greater disposition which this possesses to atrophy in old age, than other parts of the bony fabric; and he gives a case of eccentric atrophy, or *mollities ossium* in a female of seventy-two, of which, though the case has been incidentally noticed in print, the particulars have never been wholly published. He annexes a table, in which he offers a useful summary of the particulars of sixteen cases of the same disease, which he follows by many illustrative remarks. He mentions Dr Bostock's analysis of the bones in this disease, which is given in the fourth volume of the Society's Transactions, as the only one which has been hitherto published; but in this, and several other important instances, he omits the necessary reference. Mr Pereira's examination of a portion of an affected radius is very imperfect, in as much as it only gives the quantity of the earthy matter, and of the animal matter, and water not got rid of by drying. By this, however, it appears, that seventeen grains of a diseased bone gave 7.4 of earthy matter, while the same quantity of a healthy one afforded ten grains.

The last article in surgical pathology narrates a case of ***Removal of a portion of lung which protruded through a wound***;

by W. Forde, Esq.—The subject of this case was an athletic Fingo of 35, who, in an engagement with the Caffers, was transfixed by an azigai, which entered " opposite to the eleventh rib, three inches from the spine, and the same distance from the crest of the ilium;" and made its exit " in the right hypochondrium, midway between the umbilicus and the cartilage of the ninth rib, the opening being three inches distant from each." A portion of lung of five inches in length, and of considerable thickness, was protruded through the wound; and as the opening through which it escaped was small, and the lung was much injured by the man's endeavours to tear it away, the author applied a ligature tightly round it, close to the integuments, and brought the edges of the wound together by adhesive plaster, in order to favour the process of adhesion. On the third day, the desired adhesion being perfect, and the separation nearly effected by the ligature, the piece of lung was cut away with scissors, and both openings dressed with adhesive straps. In a fortnight perfect recovery had taken place.

In obstetrics, a brief account is given *of the subsequent Medical History of Mary Wren;* by Mr Birch.—In this case, recovery had taken place from laceration of the uterus, as is detailed at p. 357 of the Society's 13th volume. About nine months after Mr Birch's attendance, (which was in April 1827) Mary Wren became pregnant, and miscarried on the fourth month. In 1831, she again became pregnant, and was safely delivered after a natural labour. She became pregnant a third time in 1834, and was taken in labour in June 1835 at her full time. The membranes had given way on the 18th, and on the 20th the uterus acted for three hours " with great power and frequency," when its contractions suddenly ceased, the patient complaining of a most violent excruciating pain in the abdomen. The delivery was easily effected on the 21st without any unusual occurrence, but puerperal peritonitis is represented to have soon come on, and she died on the 25th.

Extensive peritonæal inflammation was exhibited on examination; and a lacerated opening was discovered across the *cervix uteri* in its anterior part, which dipped into the sides of the uterus. The edges were ragged and without granulations; and as no cicatrix of the former rupture could be detected, the author supposes it must have taken place precisely in the position of the present laceration.

A paper likewise occurs in the volume, which is not immediately referable to any of the preceding heads. It contains *some particulars of a Case in which the patient was saved* *from the destructive influence of Opium by Artificial respiration;* by Charles Irving Smith, Esq. *With preceding remarks,* by John Howship, Esq.—A stout young woman of 25 swallowed tincture of opium at six in the morning, and soon became insensible. At ten the stomach pump was applied, and the contents of the stomach removed. At eleven o'clock she was much worse; the pulse was sometimes as slow as 7 or 8 in the minute, and was very feeble; respiration had entirely ceased, and death seemed impending. On inflating the chest, however, by one of the nostrils, with a common bellows, the mouth and the other nostril being closed, and continuing the process for some hours, using at the same time an injection of oil of turpentine into the rectum, complete recovery took place.

The Transactions of the Royal Medical and Chirurgical Society now form so extensive a work, as urgently to demand the aid of a comprehensive index. But we are sorry to be obliged to observe, that the structure of that which has been lately published by the society, and which we have placed at the head of the present article, is not quite calculated to answer the required purpose. A general index should be to a series of volumes what a particular index is to a single one; but here, instead of the papers of every author being placed with a distinct and separate title under his name, as is uniformly the case in every well made index, the names of authors are merely given, with a reference to the volume and page in which communications by them are to be found; leaving it to the inquirer to ascertain, by a laborious and inconvenient application to various volumes, what may be the subject of the communications which any particular author may have furnished. There is, it is true, under the head of *subjects*, a reference to particular papers, but this is not sufficient; and we should be happy, then, in seeing, for the twenty volumes of the Medico-Chirurgical Transactions which are now before the public, that proper and usual facility of reference afforded, which is so important an addition to the usefulness of an extensive and valuable work. The index which is given in the second volume of the Society's Transaction for the first two volumes, forms a fair specimen of what is required for the whole.

Art. V.—*The British Medical Almanack*, 1838; *with a Supplement.* Edited by William Farr. To be continued annually. London, 1838. Pp. 223.

We take the present opportunity of saying, that this small but well-filled production continues to maintain its character for concentrating a large store of useful information.

Besides the usual articles noticed on former occasions, relating to the public medical institutions of the country, and the different examining and licensing boards, the present annual contains an abstract of the Laws relating to the Medical Profession, an Epitome of the New London Pharmacopœia, a view of the doctrines on the Functions of the Nervous System, practical remarks on Poisons, and some observations on the Statistics of Sweden.

The Almanack may be regarded as having established its character as a useful and necessary guide to every medical practitioner and student.

ART. VI.—*A Treatise on the Malformations, Injuries, and Diseases of the Rectum and Anus.* Illustrated with nine Plates. By GEORGE BUSHE, M. D. New York, 1837. Pp. 299. 8vo.

UNDER this title we have the last work of a surgeon, who enjoyed during his short professional career great reputation, and who deposited in this book the results of extensive experience in a very important class of diseases, and bequeathed it dying to the profession.[*] As a bequest of this kind it commands respect, even if it had not the name of the author in its favour; and although we may perhaps not in every respect agree with his views, still we recommend it earnestly to the perusal of every surgeon.

The whole book is divided into twenty-six chapters; and although the division itself cannot lay claim to the merit of a scientific arrangement, yet it brings all the diseases which may befal this part of the human body successively before the eye of the reader.

In the first Chapter, on the *Anatomy of the Rectum*, we get what the title of the chapter promises,—the anatomical description of the intestine, and an account of the separate elementary tissues of which it consists. If a little more notice had been taken of the anatomico-physiological relations of the bowel, of the close and important connection of its veins with the *vena portarum*, &c. it would have acquainted the reader not only with the ground on which the author is going to introduce him, but given him at the same time an idea how such an intestine might be affected, how its sufferings may react upon the whole system, and, on the other hand, how sufferings of the whole system may cause derangement in the functions of this particular organ. This objection we beg to make in the beginning, as throughout the work the general relations of the rectum to the system do not perhaps receive the attention which they merit, but the subject is treated too topically.

---

[*] Dr Bushe died soon after the publication of this work.

Of the villous or mucous coat he says, that it is more thick and vascular than in any other portion of the large intestine, but that, as its villosities are small and few in number, it does not merit the name of *papillaris* or *villosa.* He allows that it contains many follicles with distinct prominent orifices. The folds which it forms he does not allow to be so regular as to justify the valvular character assigned to them by Mr Houston. Any folds of this kind he maintains, on the ground of repeated careful examinations, to be entirely accidental, produced by the patient contraction of the bowel, and quite incapable, he believes, of sustaining the weight of the excrement. Dr Bushe, indeed, in discussing this question, is rather severe both against Morgagni, Portal, Boyer, and Mr Houston. Portal, he maintains, copied from Morgagni, without examining the bowel personally,—a statement in the truth of which we cannot agree. The account of Boyer he regards as general and superficial; and Mr Houston, he thinks, has mistaken the accidental folds indurated by alcohol for real and permanent valves. He admits also the existence of the vertical duplications of the same membrane, and the intermediate semilunar folds described by Winslow and others, but recently denied by Ribes.

Speaking of the absorbent vessels the author says, that they are much more numerous than is generally supposed. Numerous they are, it is true, but are also generally supposed to be so,—a proof of which is the long-known practice of the *enemata nutrientia*, and also the fact, that the feces, if detained too long in the rectum, become hard, because of the absorption of their fluid particles.

The facts regarding the structure of the rectum are highly necessary to the correct understanding of its morbid states. But those relating to the contiguous and adjoining textures, and especially the anatomico-pathological relation of the bowel, are if possible still more necessary to this purpose. The main agent which influences all the disorders of the rectum, and gives them their peculiar character, is the inclosing and ambient adipose tissue, the position of which is not only requisite to the motions and functions of the bowel, but exercises a very powerful influence over its diseases.

The second Chapter, devoted to the *Functions of the Rectum*, still more than the first, shows that the author is going to treat his subject too much as a surgeon, without sufficient consideration of the physiological relations of the rectum to the system. Speaking of the functions of the rectum he considers it merely as a sac, where the excrements are kept till it be time to evacuate them. For it is only of this one function, viz. the evacuation of the feces, the author speaks, and he fills nearly eight pages with a note, discussing the opinion expressed by Dr O'Bierne of Dublin, upon the mechanical process of defecation. How far Dr Bushe or Dr O'Bierne may be right on this subject, we leave the reader to decide. We only beg to mention, that although defecation is the main and most obvious function of the rectum, yet there are other accessory functions of this organ, which we do not like to see omitted in a work on the diseases of this part, as a great number of these very diseases derive their origin from the secondary functions. Besides its being *a priori* unlikely, that nature should create an organ for the single purpose of defecation, without charging it at the same time with some other functions in the living economy, we have a proof of it in the great abundance of blood which the rectum receives,—a quantity much greater than the nutrition of the part would require, and in the manner in which this blood is disposed of by the communication with the *vena portarum*, which may give the rectum some share, however distant, in the process of sanguification.

Would not the investigation of such a point throw some light upon the most frequent and important diseases of the part, viz. the whole class of the hemorrhoidal diseases, and illustrate the close connection which some other diseases of the rectum, for instance, *fistulæ*, have with a diseased state of the respiratory organs? Besides that this would have offered a more interesting theme to the investigation of the author, we are sure, that the object of illustrating the diseases of the part would have been better promoted by such an inquiry, than by the barren discussion of the mechanical process of defecation.

The third Chapter, on *Malformations of the Rectum and Anus*, appears meagre, and is necessarily so, since it could only be satisfactorily treated with the aid of a large collection of anatomico-pathological specimens at the disposal of the writer; more than we expect Dr Bushe's situation afforded. Perhaps it would have been better, if Dr Bushe had limited himself only to those malformations which admit of surgical treatment. All the malformations which may occur in this part are arranged in five classes, viz. 1. Imperforation of the Anus. 2. Imperforation of the Rectum. 3. Unnatural termination of the Rectum. 4. Termination of other organs in the Rectum. 5. Absence of the Rectum.

It is chiefly the two first classes that admit of surgical aid, and the author describes the best manner of giving it. But we see no reason why he should reject unconditionally an operation, first proposed by Littre, and afterwards performed by Dubois, viz. if the termination of the rectum, in a case of imperforation of the anus, cannot be found, to open the sigmoid flexure of the colon, and pass a sound through it towards the perinæum, so as if possible to render it salient, and thus create a mark for an incision in the perinæum. Dr Bushe allows the idea to be ingenious and imposing;

but he stigmatizes it as cruel, and hopes that no surgeon of the present day would subject an infant to this double operation. It might still, however, deserve serious consideration, whenever such a case should present itself, whether it would not be expedient, considering that death must inevitably ensue, to make an attempt by this procedure to avert the fatal termination. Though in the case in which Dubois operated in 1783, the infant died ten days afterwards, and an infant in which Desault operated died in four days, yet Duret, surgeon of the Marine at Brest, was more fortunate. This gentleman, in an infant three days old, made an incision in the belly above the left iliac region, in the spot where the sigmoid flexure formed an indistinct tumour, and where the retained meconium imparted to the skin a deep colour, introduced the finger, and drew out a portion of the sigmoid flexure, and having fixed it, made in it a longitudinal incision. The meconium immediately escaped in abundance, the vomitings ceased, and the infant, manifestly relieved, was recalled to life. He finally recovered, and was seen at Brest, when twelve years of age, with an artificial anus by M. Pelletan.

The conclusion from such a case is, that, if it be practicable to make an incision in the colon, and evacuate the contents of the bowel by the abdominal parietes, it might also be possible to introduce a sound, and carry it downwards to the lower end of the bowel, and then, making an artificial anus in the site of the natural one, attempt at once to save life, and to obviate so disagreeable an imperfection as an artificial anus in the iliac region. This method, which was proposed by Dubois, and afterwards by M. Martin, is allowed by Velpeau to deserve being employed in certain circumstances.

There is another kind of malformation of the anus which is not duly mentioned, viz. if the anus is not large enough, this may produce no inconvenience to the infant, nor even to the growing child, as in early age the feces are always more fluid, and therefore easily pass through the small orifice. But if in advancing age the feces become more solid, the sufferings begin. Boyer mentions many instances where the dilatation of an innate too small orifice of the anus has been necessary after fifteen years of age, and even at a still later period of life.

Chapter IV. *Foreign Bodies in the Rectum.*—The foreign bodies which may occur in the rectum are divided into two classes, viz. those which are generated in consequence of a diseased action of the digestive organs, and those which are either swallowed or introduced by the anus: The author gives a list of foreign bodies which have been extracted, and adds himself, in a note, that though this list may at first sight appear very odd, yet every article mentioned has, according to the testimony of the best authors, been extracted. It is certainly remarkable what extraordinary bodies have been extracted from the interior of the rectum. The author of this article extracted some years ago from the rectum of a boy, a wooden dragoon with his horse,—a toy which his playfellows had great trouble to introduce; and he had to dismount the dragoon before extraction, that is to say, he broke it with a strong bent forceps for extracting polypi.

The author gives in the following pages the rules for extracting foreign bodies from the rectum, and he is perfectly right in recommending the forefinger as the best instrument, particularly if long foreign bodies are in a transversal position in the rectum. But he should not have omitted to mention, that in many cases with females the introduction of the forefinger into the vagina is of great use, particularly as we find many instances where prostitutes have been the victims of drunken brutality.

In Chapter V. on *Laceration of the Rectum*,—the author justly distinguishes between incomplete and complete lacerations, and relates three instances of the incomplete laceration from his own practice. From two of the individuals mentioned, Dr Bushe had some months previously removed piles. In all three cases the accident took place through the expulsion of indurated feces, and all soon got well under proper treatment.

The complete laceration, where all the constituent membranes of the rectum are lacerated, is divided very properly into three species. The first is that which begins at the orifice of the anus, and never extends very far upwards, viz. the rupture, produced by parturition. The second is where the rupture begins within the anus, and where the orifice of the anus may not be injured. This kind is produced either by foreign bodies in the rectum, or by an unnatural position of the child during parturition, or by bad management of the forceps, and the like causes. The third variety, fortunately a rare occurrence, is where the *recto-vaginal* partition, the *perinæum*, and the *sphincter ani* are lacerated, likewise caused by parturition.

The author, after mentioning the circumstances which are apt to produce the first kind, and which depend either on the mother or the child, proceeds to give rules for the treatment of these ruptures, and we think, that every surgeon would do well in following them, except what regards the *sutura perinaei*,—a point on which we do not agree with Dr Bushe. He says, " it is only at the period of suppuration, when granulations sprout up, that sutures should be inserted." In many instances we may do without inserting any suture, but if we do, it should be done if possible immediately after the accident has taken place. We could from our own, although not very extensive experience, give several cases, where we succeeded in healing the wound *per primam* *intentionem*. Dr Bushe then cautions against a too superficial insertion of the sutures, and we fully agree with him, but do not see how this is prevented by his newly invented needle, a representation of which is given in Plate viii. fig. 4, 5, 6, 7. Ingenious as it is to transfer the *sutura circumflexa*, which in modern surgery is only used in the *labium leporinum*, from the one opening of the alimentary tube, *i. e.* the mouth, to the other, the anus, still we cannot perceive, how any benefit can be derived from Dr Bushe's curved perinæum needle. The needles for the *sutura circumflexa* are used in the operation of the *labium leporinum*, because there is a considerable loss of substance, and the thread of a common suture would cut through. In the *ruptura perinæi* there is no loss of substance, on the contrary the parts are very lax, and do not require much stretching. The subsequent inflammation and swelling may be kept down by cold applications and proper regimen. The reason of Dr Bushe's recommending his needle is, because he thinks, that, by means of it, he gets more easily to the bottom of the cleft. We cannot see, however, how this should be more easily accomplished with his than with any other needle. There is the same difficulty in reaching the bottom of the cleft with Dr Bushe's as with a common curved needle; that being done, there is no reason for leaving the needle in the cleft, where it may produce irritation, as it remains in a transverse position, while the legs are kept close together. Besides Dr Bushe's needle making the operation more complicated, we should undoubtedly prefer the common suture, and would for the insertion of it recommend the use of two needles, *i. e.* one at each end of the thread, and insert them from the bottom of the cleft outwards, using a separate needle for each labium of the wound.

Dr Bushe relates one case of rupture of the recto-vaginal partition, perinæum, and *sphincter ani*, on which he operated thirteen months after the accident had occurred, and after the surfaces of the wound had healed separately, but he does not say whether or not he succeeded in the union, which we should have been the more glad to learn, as such cases very frequently have eluded all the art of the best surgeons. Candid confessions of this kind will be found in Boyer and other writers on the subject.

In the sixth Chapter, on *Inflammation of the Rectum*, after enumerating the causes which may produce this inflammation, the symptoms and treatment are shortly and correctly given.

In Chapter VII. *Inflammation and excoriation of the Anus* are treated rather superficially. There is for instance no notice taken of the excoriation to which infants are subject, particularly if the nurse does not keep a proper diet, or suffers under acrimony of the whole system. This excoriation becomes often so alarming, that it makes the infant restless and sleepless, and threatens it with atrophia, resisting all external applications, until we either change the diet of the nurse, or give the infant another one.

In treating shortly in Chapter VIII. on *Inflammation of the Rectum and the Anus, arising from the application of gonorrhœal matter*, injections of the superacetate of lead, sulphate of copper and nitrate of silver, are recommended. The author does not mention that females are more subject to this kind of inflammation than men, because of the difference in the construction of the parts, which permits the gonorrhœal matter more easily to come in contact with the anus, especially when the patient lies on her back; the discharge being also much more copious with females than with males.

We saw a violent inflammation of the rectum, which extended from the prostate to this intestine, after an imprudent administration of cubebs in an inflammatory gonorrhœa.

Rust mentions a very interesting case, the consequence of an ill treated ulceration of the anus and buttocks, produced by a corroding discharge from the vagina, in consequence of which the buttocks had become adherent, and the orifice of the anus became so narrow, that the feces were evacuated only of the thickness of a common quill, and mostly involuntarily. The evil had been mistaken for paralysis of the sphincter, and for contraction of the rectum itself, and of course treated without success. Rust recognizing its nature, separated the buttocks with the knife, prevented their reunion, and thus restored the sphincter to its natural dimensions and functions.

Chapter IX. *Fissure of the Anus;* a disease, which was originally observed by Lemonier, but first circumstantially described by Boyer, who also taught the appropriate treatment. Dr Bushe's account of it, and the recommended cure, agree with Boyer's in the main point, only that Dr Bushe seems to think less of the co-existent spasm, which Boyer, Dupuytren, Blandin, &c. take to be the original cause of it, and with which at least it is very often combined.

Dr Bushe relates four cases furnished by his own experience. The first was healed under low diet, daily enemata, and the application of the saturnine ointment, (*unguentum acetatis plumbi.*) The second case was cauterized with nitrate of silver, and the cure completed in about a fortnight by the application of an ointment consisting of one part of extract of belladonna, and seven parts of spermaceti ointment. The two other cases required the division of the sphincter before they could be cured.

Neuralgia of the extremity of the Rectum, considered in Chapter X., as an original idiopathic affection, is certainly of very rare occurrence. The description which Dr Bushe gives of it seems to be true, and agrees with what other writers say on the subject. Dr Bushe relates several cases. But we believe, there are amongst them only two which, strictly considered, can be classed in this chapter, viz. the first and the last, where the neuralgia of the rectum interchanged with neuralgia of other parts, and both of which showed that characteristic symptom of neuralgia, *i. e.* relief of the pain by pressure. Those cases where one particular spot of the gut is exceedingly painful when pressed, as that in which Dr Bushe divided the sphincter with success, belong to another head, perhaps that of spasmodic fissures.

Chapter XI. *Spasmodic Contraction of the Sphincter Ani.*—This chapter might have been left out altogether, as the spasmodic contraction of the *sphincter ani* is either merely a momentary symptom of other diseases, particularly of the urinary and genital system, or it belongs to another class of diseases of the rectum, viz. *fissuræ* of the anus, or *neuralgia* of the *rectum.*

Ulceration of the Rectum, though the subject of Chapter XII., hardly required separate consideration; yet the many good practical hints given make this a valuable part of the book, and deserve the attention of every young practitioner.

Chapter XIII. *Venereal Ulceration of the Rectum.*—The antisyphilitic treatment is recommended in addition to the treatment prescribed in the preceding chapter.

Chapter XIV. *Affections called Hemorrhoidal.*—This chapter, one of the most important in the book, is treated with so much judgment, and, so far as the limits of the work allow, with so much exactness, that we think it merits a short abstract.

Dr Bushe, following the arrangement adopted by Montegre, begins by mentioning the primary symptoms of the hemorrhoidal affections, viz. congestion, hemorrhage, tumours, inflammation, and mucous discharge, and adds the whole of the secondary symptoms. After that the primary symptoms are spoken of separately.

Hemorrhage.—The evacuated blood, which is of a bright vermilion colour, is exhaled by the extremities of the capillary vessels; however, when the bleeding has been profuse, Dr Bushe admits, that the blood-vessels themselves may become so debilitated, as to allow the blood to escape from their extremities. The quantity of blood varies, but the amount is not always in proportion to the severity of the symptoms, denoting the loaded state of the hemorrhoidal vessels. In a note are added a number of wonderful and, as Dr Bushe justly remarks, undoubtedly exaggerated statements of enormous quantities of blood lost in this way, taken from all the old writers on the subject. The suppression of this flux is attended with imminent risk; and a few cases of the author's own obser-

vations are added to show the danger. This paragraph is closed by giving the diagnosis from other hemorrhages from the intestines.

Tumours.—The hemorrhoidal tumours are divided into two classes, those within the anus and those immediately without the anus. The size of those within the anus varies. A representation of several of them may be seen in the second plate.

Dr Bushe frequently injected and dissected them, and found them to be of a spongy reddish substance, containing both arteries and veins; but he never found them to be only enlarged veins, varices. In a note a full list of writers on the subject is given, who either corroborate the author's opinion with regard to the substance of the tumours, or who take them to be varices. Dr Bushe refers those who wish to become more acquainted with the peculiar opinions of each of these authors to their works. In consequence of the irritation and pressure of the feculent matters, as well as the effort necessary to dislodge it, blood accumulates in the rectum so that, though there has been no previous hemorrhage, yet from these tumours blood may be exhaled. Sometimes, though rarely, they may not bleed for weeks or months; but Dr Bushe says, he has never seen a case in which they did not bleed at some time or other.

It not unfrequently happens, that, in consequence of inflammation in these tumours, small abscesses are formed in them; occasionally they are attacked with ulceration, and though they retain their spongy structure for years, yet it sometimes occurs, that, from constant irritation, they are transformed into a semicartilaginous mass, being firm, yellow, and nearly bloodless. The 6 and 7 Figs. of Plate 2d, represent such a tumour which Dr Bushe removed from a lady. In some cases, when we cannot detect any other lesion, the patient is affected with contraction of the *sphincter ani*, and exquisite pain, which extends to the uterus, vagina, and external organs of generation in the female, to the perinæum and testicles in the male, and to the bladder and urethra in both sexes. Three such cases are related, in which Dr Bushe removed the tumours with success. These tumours may be confounded with prolapsus of the mucous membrane of the rectum, or with polypi of this intestine, but Dr Bushe gives a very correct mode of distinguishing these complaints.

The inflammation which accompanies the formation of these tumours, and which frequently acquires great severity when there is no hemorrhage, generally is arrested by the hemorrhoidal flux.

Mucous discharge may arise from the same cause as inflammation, and in this way supply the place of sanguineous evacuation. Sometimes it precedes, but more commonly follows, the hemorrhoidal flux. This discharge may be distinguished from the venereal *blenorrhagia* by the history of the case, and generally by its tenacious and transparent character. After having thus fully developed the symptoms of the disease, the author treats of its causes with much exactness, and then follows, in describing the treatment of these affections, the same order which he adopted in investigating their pathology. Dr Bushe does not, as many authors before him have done, recommend bleeding at the arm against profuse hemorrhage from the rectum. Although this should never be a general practice, still there are cases where we can hardly do without it. For instance, in a case of profuse hemorrhoidal flux threatening the life of the patient, after the usual remedies have failed, a venesection of a few ounces from the arm, combined with cold applications at the anus, will not only stop the hemorrhage, but also, by acting *per revulsionem*, and giving the current of the blood another direction, prevent serious disturbances in the vascular system.

Various remedies are proposed for the inflamed and painful hemorrhoidal tumours; but as a last resort, their removal by an operation is recommended, giving the proper precautions, and reminding the surgeon of the constitutional origin of the disease. Dr Bushe, who is a warm advocate for the ligature in preference to the knife, says, that he never has seen a serious inflammation after the ligature, but often a considerable hemorrhage after the removal of these tumours with the knife; and adduces further reasons for his preference of the ligature. We do not think that an invariable and positive preference should be given to either of these methods, but the nature of the case should determine which of the two would be most applicable. Dr Bushe gives the general rules, and his mode of applying the ligature, accompanied with a drawing of the instruments he used for the purpose.

For the better illustration of the subject three cases are related where he removed the tumours. In the first case, the patient suffered afterwards from vertigo, and the second was attacked with spitting of blood; a proof that the removal of the tumours often endangers the general health. If the external tumours become inflamed and very painful, the author recommends to split them, and lay them freely open,—a very good practice, which never fails to afford immediate relief. For the treatment of inflammation the reader is referred to the sixth chapter. Against the mucous discharge, when it becomes too copious, the proper remedies are recommended.

Chapter XV. *Enlargement of the Hemorrhoidal Veins.*—After the preceding chapter but little remained to be said on this subject, and it seems the author only added this chapter for the purpose of distinguishing this kind of enlargement from the hemorrhoidal tumours. In plate iii. fig. 2, the anus of an individual is represented who laboured under excessive dilatation of the hemorrhoidal veins; and the appearance of this disease is certainly very different from that delineated in plate iii. fig. 1, and plate ii. fig. 1.

In Chapter XVI. *On Prolapsus of the Rectum*, two forms of the disease are distinguished, the one where the mucous membrane alone is prolapsed, whereas in the other all the coats of the rectum come down. The predisposing and occasional causes of the prolapsus are briefly discussed, the diagnosis from the intussusception is given, and the immediate reposition recommended. Different methods of performing it are mentioned, and afterwards the treatment directed against the causes of the prolapsus. (In an inflamed prolapsus with much swelling, where the reposition, according to the general rules, would have been very painful and difficult, we saw much benefit from the introduction of an icicle, after the melting of which the swelling was considerably diminished, and the prolapsus easily reposited.)

Should the means recommended fail, and the coats of the rectum become or remain so lax as to come down at every exertion, we must proceed to a surgical operation, the nature of which depends upon the character of the disease, but which is analogous with the operation for ectropium and entropium. When there is a considerable prolapsus, one or two (Dr Bushe allows even three and four) portions of the mucous membrane, according to the extent of the disease, ought to be pinched up with the forceps on opposite sides of the bowel, then tied, and finally snipped off with curved scissors outside of the ligature. The prolapsus must then be reduced, and the patient put to bed under proper regimen. The ligatures are generally cast off within ten days, after which the healing process goes on, and the adhesion becomes so firm, that the prolapsus does not appear again. If the sphincter be relaxed, and the folds of fine skin at the anus elongated, a similar operation as the one just described ought to be made. It consists in excising some of the mucous membrane and fine skin of the verge of the anus. When a portion of the prolapsed mucous membrane becomes indurated and partially ulcerated, it should be removed by excision.

Relaxation of the Anus, Chapter XVII., may either be a symptomatic paralysis after disease or injury of the brain or spinal chord, or a consequence of general exhaustion, protracted disease, old age, &c. &c., when of course, as a symptom of other diseases, the treatment must be directed against the main cause; or it may be produced by repeated and excessive straining of the anus, in which case it falls more or less under the chapter of prolapsus, and must be treated accordingly.

To *Relaxation of the Rectum, with invagination of the mucous membrane*, Chapter XVIII., the disposition is produced by repeated distension of the bowel with feces or injections, and it may take place from the same causes which in others produce prolapsus; in fact, it is a kind of incomplete prolapsus, and often terminates in complete prolapsus. The nature of the case is easily discovered by the introduction of the finger. A well-regulated diet, gentle aperients, emollient followed by astringent injections, other local applications to restore the tone of the gut, and finally the bougie, or as Dr Bushe recommends in this case, an inflated gut will generally suffice for the removal of the disease. At the end the author relates a case of his own observation.

Chapter XIX. *Itching of the Anus.*—Here we find another chapter devoted to a mere symptom of other diseases, which, however, is often very obstinate, and exceedingly troublesome, and this we believe induced the author to discuss it in a separate chapter. It often precedes or accompanies the development of hemorrhoids, being produced by the congestion of the blood to these parts. Women, who have lately ceased to menstruate, suffer from it, because at that period of life the current of blood, which was hitherto directed to the genital organs, and was discharged by the menstrual flux, now takes its direction to the hemorrhoidal vessels. Ascarides, cutaneous eruptions near the anus, a morbid and irritating state of the alvine excretions, violent drastics and the like, produce this troublesome symptom, in the management of which we should first endeavour to discover the cause, and then treat it accordingly. The local applications which Dr Bushe found the most useful, and which certainly are so, are the yellow wash, sugar of lead water and laudanum, vinegar, tar, and citrine ointment. If these fail, Dr Bushe recommends rubbing the itching surface lightly over with nitrate of silver, so as to produce a slight exfoliation of the skin, and then washing the parts frequently with water and the common turpentine soap.

Chapter XX. *Excrescences about the Anus.*—These sprout from the fine skin and mucous membrane in the neighbourhood of the anus, and assume a variety of forms, in consequence of which, the different names, as, sycoma, thymion, ficus, marisca, porrus, myrmecion, condyloma, cristæ, verrucæ, &c. &c. have been given to them. The cause of these productions is inflammation of the fine skin and mucous membrane, and this is generally the result of friction, compression, erosion, or more commonly the syphilitic poison. Those within the anus ought to be excised with curved scissors, and the cut surface touched with lunar caustic. When they are without the anus, they may be destroyed with lunar caustic, savine powder, sulphate of copper, the red oxide of iron, and other appropriate caustics. The powder of the leaves of the *Thuia occidentalis* or incense tree, have been found more useful than that of savine leaves.

Chapter XXI. *Polypi of the Rectum.*—Dr Bushe, contrary to Sanson, is of opinion, that the mucous species are more frequently met in the rectum than the sarcomatous. In plate vi. fig. 1 and 2 is given a representation of different sized polypi. We are surprised that the author, who is so warm an advocate of the ligature for the removal of hemorrhoidal tumours, gives for the removal of the polypi decidedly the preference to the excision with curved scissors. Although the application of the ligature to a polypus, especially when high up in the *rectum*, is more difficult than the simply cutting it out with curved scissors, yet we should (and there are the greatest authorities for this method) decidedly prefer the ligature, wherever it is possible to apply it; for it cannot be denied that the mere cutting away of a parasite cannot be considered as an eradication; at least there is no reason why they should not grow again, since, however close to the root we may cut them, the circumstances on which their growth depends are not removed. It is different with the ligature, for its effect is not limited to the spot where it is tied. While the parasite dies below the ligature, an inflammatory reaction and suppuration is developed above, which reaches the root, and eradicates the polypus.

Chapter XXII. *Abscess near the Rectum.*—The author mentions circumstances peculiar to the rectum, which favour the collection of matter in its neighbourhood, and account for their frequent occurrence. These abscesses are divided into two classes, those independent of disease of the rectum, and those which arise from a morbid condition of this intestine. The first class is subdivided into idiopathic, traumatic, critical, and symptomatic; the second class into idiopathic, traumatic, and symptomatic. These divisions are based upon the different nature of the disease, their character is well illustrated, and the treatment modified accordingly. The author is perfectly right in impressing the importance of an early opening, in fact, as soon as there is anything like fluctuation to be felt; for if purulent matter remains inclosed, it will in a very short time produce great excavations and devastations in the loose cellular tissue which surrounds these parts.

Chapter XXIII. *Fistula in ano* is (as has been done by most authors) divided by Dr Bushe into three species.

1. The complete fistula, which has two openings, one in the rectum and an external one.

2. The incomplete internal or external blind *fistula*, which has an opening in the gut, but does not open externally; and

3. The incomplete external or internal blind *fistula*, which has

an external opening, but does not perforate the gut. This division has antiquity and a great many valuable authorities in its favour, and we do not blame Dr Bushe for adopting it. But there are many modern writers on surgery, and good authorities too, who deny the existence of the incomplete external fistula, asserting, that, whenever there is an external opening, there must also be one in the gut. On this point, Boyer and Rust may be consulted. It is not for us to decide this question, nor do we think that Dr Bushe could have finally decided it; but in a monography on the diseases of the rectum, such an important question ought not to have been silently passed over.

What Dr Bushe says on the surgical treatment of fistula is excellent, though not new. But we believe he is rather too prompt with the knife. For although he mentions that fistula is often connected with pulmonary and other diseases, yet we fear that a young surgeon, who has read nothing but the work of Dr Bushe on the subject, will be very apt to do mischief. The *fistula in ano*, more than any other form of fistula, is a constitutional disease, and in a degree, that its small size, and the trifling trouble which it often occasions, is in no proportion to its constitutional importance. If the *fistula* is not the consequence of a mere local injury or affection, we should never operate on it with the intention of healing it; and even if it were originally a mere local disease, yet has existed for a certain length of time, we should be very cautious in operating, as it is often no great trouble to the patient, especially if the external opening, which sometimes shuts up, is always kept large enough. Luckily nature often opposes the healing, and eludes the operation, and certainly the great number of failures in healing *fistula in ano*, which may be said to occur daily, are not the consequence of a bad operation, but because nature wisely opposes herself to the interference of the surgeon; and, on the other hand, we see a *fistula in ano* which eluded, perhaps, more than one surgeon's skill, heal of itself in a very short time, if the constitutional cause is removed.

For the performance of the operation after it is decided upon, Dr Bushe seems to prefer the knife so much that he does not even bestow on the ligature a single word.

Chapter XXIV. *Contraction of the Anus.*—This condition of the anus may be produced, 1. By the approximation of portions of skin naturally at a distance. (The case related by Rust, which we mentioned under the eighth chapter, would accordingly belong to this chapter.) 2. By the deposition of lymph in the submucous cellular tissue constituting a species of ring around the anus. 3. By the effusion of lymph on the surface of the mucous membrane, which frequently assumes the form of filamentous bands; and 4. by a process of disorganization, manifested by irregular thickening, cartilaginous induration, and partial ulceration of the fine skin and mucous membrane, extending upwards sometimes for more than an inch.

The character of the contraction easily indicates the causes. The symptoms are similar to those of stricture of the rectum, and the introduction of the finger soon determines the nature of the disease. The treatment must be adapted to the causes. The bowels should be kept open, inflammatory symptoms subdued, and tumours if present ought to be removed; but a final cure is only to be effected by a cautious employment of bougies. Several cases are related for the better illustration of the disease.

Stricture of the Rectum, treated in Chapter XXV., is either functional (spasmodic) or organic. Of the existence of the first kind, the spasmodic stricture of the rectum, Dr Bushe says, he was only convinced within the last three years, when he saw two cases of it; and he begins the chapter by giving an outline of both, and their disappearance under proper treatment, and the daily introduction of the bougie. Dr Bushe examined several strictures after death, and found them either occupying the whole circumference of the rectum, or passing only partly around it. Dr Bushe says, " some authors are of opinion that there is frequently a predisposition to stricture of the rectum. This I will not deny; but, at the same time, I must confess, I am sceptical, because my own observation has not furnished me with a single fact leading to the confirmation of such opinion." The validity of this opinion depends very much, if not altogether, on the nature of the stricture. To ordinary stricture depending on simple inflammatory thickening and interstitial deposition of lymph, there may be no predisposition. But that which is the result of scirrhous enlargement either of the muciparous follicles or the mucous membrane of the *rectum*, is most generally the result of constitutional taint, or that species of distemperature which tends to produce *scirrhus* in several organs at the same time or successively. Thus in a lady who had suffered three years under all the symptoms of stricture of the rectum, examination proved the existence of a stricture about four inches within the anus. Under proper treatment, and the application of bougies, the symptoms of stricture disappeared, and the lady seemed to enjoy perfect health. But about four months after, her stomach began to be affected, and she died within seven months, (eleven months after the stricture had been cured,) under all the symptoms of induration of the *pylorus*.

The author enumerates all the symptoms which accompany the disease, whose real nature, however, is determined by the particular shape of the feces, if hard, and finally by the introduction of the finger; for the stricture is seldom so high up that it is not within reach of the finger. The author enumerates accurately the diseases with which a stricture may be confounded, and he specifies the means by which they may be distinguished. We must remind the young practitioner, however, that the diagnosis is not always so easy as he may be disposed to believe after so plain a development of the different symptoms, particularly if the stricture should not be within reach of the finger. The treatment recommended by Dr Bushe may be adapted to the nature of the case; but we can approve neither of his bougies, nor of his whalebone-stalk, mounted with a three inch long ebony button; nor of his newly-invented silver machine for the purpose of removing strictures, a drawing of which is given in plate viii., and of which we think still less than of the first kind. Dr Bushe mentions some other kind of bougies, those of White and Salmon, which consist of a piece of fine linen folded together, and heavily coated with a mixture of wax and lard, or wax and diachylon plaster. A bougie prepared in the following manner, answers the purpose better than any other. The bougie we allude to is made of a long piece of common sponge, dipped in a concentrated solution of gum arabic. The whole length of it is then tied up with a string, the circular turns of which must be close together. Thus it must be dried when the string is taken off, and the surface made smooth with a knife or a file. So soon as the gum arabic is dissolved by the moisture of the part into which this bougie is introduced, the sponge gradually regains its natural elasticity, and extends the part without pressing or irritating it, as it assumes the shape of the gut.

Carcinomatous degeneration of the Rectum, Chapter XXVI., when fully developed is easily recognized; but in its beginning it may be confounded with various other diseases of the part; but the inefficacy of all our remedies, and the gradual increase of the evil, let us even in the beginning suspect what we have to deal with.

With regard to the treatment we must confine ourselves to the palliative method. The excision of the degenerated portion has been recommended, and Dr Bushe made it once, but without final benefit, and we should certainly never attempt it; for, besides the objections against excision of carcinomatous degenerations in general, the structure, situation, functions, and other relations of the rectum offer such obstacles to success, that the prognosis can never be favourable. This chapter, and with it the book, is closed by the description of a disease taken from Cayol (Clinique Medicale, Paris, 1833,) which may be confounded with cancer of the rectum. As our author has never seen this disease, he says that he does not feel qualified to offer any remarks on it.

The account now given of the present work will communicate some idea of the nature of its contents, and of its general merits. Justice requires us to say, that Dr Bushe has evidently been at great pains to throw light on the nature and treatment of the diseases, injuries, and malformations incident to the *rectum*, both by studying carefully the works of the best informed authors, and by giving at the same time the results of his own observation and experience; and his work consequently contains much useful information. We cannot say, nevertheless, that it is unblemished by faults; and one that runs through it is a tone of confidence and decision, with some degree of exclusiveness, of which we cannot approve in scientific researches. We must not forget, however, that the work appears to have been composed during a period of bad health, when the mind cannot be said always to retain its uniform clearness and self-possession; and a still more painful reflection is, that the tomb has now closed alike over the merits and the faults of its author. This consideration, we confess, completely disarms our critical spirit, even had there been more strong cause for its exercise; and we trust that it will induce our readers to receive the work, if not gratefully, at least with indulgence.

Like most American books, it abounds with typographical errors; but these we charge not on the author.

ART. VII.—*On the Nature and Treatment of Diseases of the Heart; with some new Views of the Physiology of the Circulation.* By JAMES WARDROP, M. D., Surgeon to his late Majesty George IV., Lecturer on Surgery, &c. &c. Part I. 8vo. London, 1837. Pp. vi. 100, and 20. Four Plates.

THIS, the only published part of Dr Wardrop's work, contains observations on the structure and functions of the heart, interspersed with some physiological researches on the circulation.

The author begins by pointing out some peculiarities in the organ, such as the greater compactness, firmness, and elasticity of its muscular parietes, their being supplied with an unusual number of blood-vessels, and their having no repose; the vessels passing along deep tendinous grooves, and thus suffering no compression from the actions of the muscles; the arteries supplying not only the substance of the heart itself, but its investing and lining membranes, and inosculating with branches of the internal mammary and bronchial arteries; the current of the blood in the large branches of the coronary veins running in the same direction as that in the arteries, contrary to what generally occurs. For regulating the distribution of blood through the system, five organs besides the heart are employed, the arteries, capillaries, veins, muscles, and respiratory apparatus, on each of which he makes some remarks. Of these we quote the following on the influence of muscles on the circulation.

"The fact, that the circulation of the blood is carried on in some of the lower animals, as in worms and insects, without a heart, and only by the almost incessant motions of their bodies, might have indicated that muscular contractions have at least *some* influence on the circulation of the blood in the arteries as well as in the veins.

"So important, indeed, is the influence which the muscular movements have on the circulation of the systemic blood, that in various tribes of animals the heart is found developed more and more perfectly, in proportion as the body is less exposed to motion. Whilst, therefore, the restless *insect* requires no heart to impel its blood, the *shell-fish,* fixed and motionless on its rock, is provided with a central organ or heart to carry on the circulation. In man, the duty required of the heart must therefore vary with his bodily pursuits, the sedentary habits of some causing this organ to derive little or no assistance from those of locomotion, whilst the active occupation of others will materially aid the circulation of the blood. When the respiratory apparatus is healthy, and the circulation through the right heart undisturbed, the pulmonary veins afford a sufficient supply of arterialized blood to the left heart for the ordinary purposes of the systemic circulation. During sleep this must be strictly true; but when the heart is suddenly required to act with unusual vigour, a circumstance which is constantly taking place whilst we are awake, an increased supply of blood then becomes necessary, the energy of the heart depending on the quantity of blood with which it is supplied. This important office, we shall find, is fulfilled not only by *accelerating* the flow of the venous blood into the right heart, but, as I shall endeavour to show, also by *impeding* the exit of the arterial blood from the left heart, and both these purposes are admirably effected simply by the change of form which the muscles undergo during their contractions."—Pp. 16, 17.

In support of these views, he refers to the observations and experiments of Mr Hyslop, which will be found at length in the Third Part of the present Number. The following experiment also is stated in corroboration.

"If the radial artery of a person who is powerfully contracting the muscles of the arm be examined, its pulsations are soon found to become feeble, and at last they are scarcely perceptible, whilst the moment the muscles are relaxed, the artery is perceived to beat with its natural force. By the same experiment it may also be shown, that the effect of impeding the transit of the blood in the arteries, is to increase the action of the heart, it being found, that, in proportion as the strength of the pulsations of the radial artery diminishes, so is the impulse of the heart increased."

Dr Wardrop next considers the position of arteries in relation to muscles, some being exposed, and others protected against pressure. Wherever it is necessary that an organ should be at all times supplied with an equal quantity of blood, either the arteries are carefully protected from pressure, or the supply is equalized by numerous *anastomoses*; and, on the contrary, where-ever this is not required, or rather when different quantities of blood are necessary at different times, they are so placed as to be inevitably more or less compressed by the adjacent muscles. In like manner the position of the veins varies. When both systems of vessels are to be compressed the veins accompany the arteries, while in opposite circumstances they are differently placed; thus, in the internal viscera the veins do not accompany the arteries. In support of these positions, the author adduces several instances.

The action of the muscles in impeding the flow of arterial, and accelerating that of venous, blood, Dr Wardrop denominates the musculo-cardiac function. By it he explains various phenomena, as yawning, stretching the limbs in passing from sleep to watchfulness, the contraction of the muscles previous to making any exertion, as running, leaping, preparing to endure pain, in parturition, &c.; the convulsive movements of the voluntary muscles in recovering from syncope; the effects of bodily exercise; the difference in the number and strength of the heart's pulsations, according as the body is in the recumbent or erect position, &c. The following are instances adduced by him of the influence of the function in disease.

> "My attention was directed to some of these phenomena, and to the physical explanation of them which I have now given, when attending a patient who had frequent attacks of gout, and who had been some time before affected with an arthritic inflammation of the *pericardium.* After that illness he suffered from palpitations of the heart every morning, just at the moment when he awoke, but they continued only a few minutes. On inquiring if he was in the habit of yawning and stretching his limbs, he then stated that he always did so, whilst in the act of awaking, and that it was immediately afterwards that he felt the palpitation. He farther observed when interrogated on this point, that if he accidentally awoke during the night and stretched himself, palpitation of the heart always ensued.
>
> "The effect of yawning and stretching the body in disturbing a diseased heart, I also observed in a person who had for many years suffered from symptoms of hypertrophy, and who was recovering from a febrile illness, for the relief of which an antiphlogistic treatment had been pursued. When convalescent, this patient had no uneasy feelings remaining, except a pain in his head, which came on every morning immediately after he awoke, but did not continue longer than ten minutes. From the circumstance of this headach occurring only after he awoke, and from his stating that he was in the habit of yawning and forcibly stretching his limbs whilst he was awaking, it appeared to me probable that the increase of blood in the irritable heart caused by these movements, produced the *headach*, in the same manner as it had in the former instance caused *palpitation.*"—Pp. 36, 37.

Dr Wardrop next alludes to the effect of inspiration assisting the passage of the blood into the right side of the heart, and of expiration in the transmission of blood from the lungs to the left. By slow and protracted inspiration, the action of the heart can be rendered so languid that the pulse cannot be perceived at the wrist, while, by quick breathing, it can be greatly accelerated.

" The influence of the respiratory organs on the action of the heart was strikingly illustrated in the case of a lady whose heart sometimes acted so irregularly that she was apt to fall into a state of syncope. She accidentally discovered that by the act of singing she could prevent herself from fainting. ' I will write you,' she observed, ' something very remarkable about myself, namely, that when my heart is in a great flutter, I am not certain whether I shall faint away, singing removes it almost directly. One Sunday, in church, I expected every moment that I should be obliged to be taken out, and disturb the congregation, when happily the psalms were beginning to be sung, and I instantly joined in the psalm, and the comfort the act of singing then gave me was almost instantaneous.' "—Pp. 44, 45.

Besides the offices just mentioned of the respiratory apparatus connected with the circulation of the blood, the author conceives that there is a third accessory function performed by the lungs themselves, the pulmonary vessels serving as a reservoir for receiving any surplus quantity of blood which the cavities of the heart cannot admit. This he denominates the pulmo-cardiac functions.

For the fulfilment of the pulmo-cardiac function the structure of the lungs is well adapted. The pulmonary vessels are susceptible of various degrees of distension, and the structure of the lungs which enables the air-cells to accommodate themselves to different quantities of air during respiration, permits these vessels to receive the variable amount of blood which may be impelled into them. When the blood is thus accumulated in the pulmonary veins and both sides of the heart, the frequency of respiration increases in proportion to the degree of impediment offered to the distension of the air-cells, and this will continue till the circulation be equalized. Besides this, however, the pulmonary vessels are relieved by the subcutaneous, which are liable to no muscular pressure. These act as reservoirs, and receive the blood, which could not be admitted into the pulmonary vessels without interrupting respiration. Thus, when congestion occurs in the heart, the pulmonary vessels receive the additional blood propelled to that organ, when these are distended, the blood stagnates, and accumulates in the subcutaneous veins, as is seen in the race horse after violent exertion.

These various contrivances, however, may not prove sufficient, when muscular exertion is carried to its extreme limits. The pulmonary vessels and the cavities of the heart then become distended to such a degree, that the balance of the circulating and respiratory apparatus is destroyed, the cavities of the heart cannot empty themselves, and the lungs are prevented from receiving a sufficient quantity of air for the arterialization of the blood. In this state of congestion, the pulmonary vessels frequently give way, and hemorrhage ensues, which is sometimes fatal. Death also may take place from suffocation. But even though congestion be not carried so far as to destroy life, a permanent disturbance of the circulation may take place, and respiration be afterwards imperfectly performed.

Dr Wardrop next considers the means by which a person attains the power of regulating the organs of respiration and circulation, so as to be able to make violent muscular exertions, till his muscular energy be exhausted. The art of training he conceives to consist in accustoming an individual to limit his inspirations, so as to prevent such a degree of distension of the air cells as would prevent the ready flow of blood from the pulmonary arteries into the pulmonary veins.

In some of the succeeding pages, the author applies his doctrines to the explanation of laughing, crying, weeping, sobbing, sighing, vomiting, coughing, sneezing, hiccup, sea-sickness, &c. and concludes with some observations on the reciprocal influence of the heart and brain, that of the heart and digestive organs, on the blood, the pulse and the impulse and sounds of the heart.

In the very brief view which we have exhibited of this portion of Dr Wardrop's work, we have by no means given the substance of all or even the greater part of his interesting remarks and speculations. To have done so, we must have transferred nearly the whole to our pages. The succinct style in which a great portion of it is written defies abridgement.

In these circumstances, we have much pleasure in referring our readers to the treatise itself, confident that they will be amply repaid for the short time required for its perusal, by the many facts applicable to every-day practice, which they will there find ingeniously if not always satisfactorily discussed.

ART. VIII.—*Transactions of the Glasgow and Clydesdale Statistical Society, instituted April* 1836. I. *An Account of the Former and present state of Glasgow, comprehending its Commercial, Manufacturing, and Ecclesiastical Concerns.* By JAMES CLELAND, LL. D., President of the Society, Member of the Society of Civil Engineers, &c. &c. Read 2d November 1836.

The taste for statistical inquiries, which is at present diffusing itself in this country, cannot fail to be of the utmost benefit to the improvement of society, both generally, and in its individual parts. It is universally admitted that, in order to frame correct ideas on the influence either of particular occupations, particular modes of life, peculiar customs or habits, or even the physical and local circumstances of communities and bodies of men, it is quite nugatory to study the effects of these on a few individuals, and completely indispensable to observe their operation among large and numerous masses of human beings. It it only in this manner that it is possible to draw a broad and visible line of distinction between those facts which are general and comprehensive in their application, and those which are partial and limited, to distinguish the results into general rules and exceptions, and to enable us, consequently, in concerting practical measures, to select those only which admit of general application, and which, from this circumstance, may produce the beneficial effects anticipated. Statistical information, indeed, must be regarded as exemplifying the application of the inductive and analytic method of inquiry to the political, civil, and social relations of mankind, and, consequently, as the true and solid basis of all correct views, either on the present state and mutual reaction of those relations, or on the future improvement of the race, and the means by which that improvement may be promoted and carried into effect.

Important, however, as this species of inquiry is, and useful as the information procured by it must be allowed to be, it is at once singular and melancholy to remark how much it has been neglected in this country. While in France, in Germany, and, above all, in Sweden, statistical information on various points in political economy, revenue, and the natural history of mankind, had continued to be collected by various diligent inquirers, from an early period of the eighteenth century, almost nothing deserving the name had been accomplished in this country. The observations by Captain Graunt on the bills of mortality, [*] and the researches of Dr Nettleton [†] and Dr Jurin, [‡] on the statistics of inoculated small-pox, and their influence in increasing the probabilities of infantine and human life, are the only undertakings which this country had at that period witnessed. At a still later period, we had further attempts partly on the same subject, partly to determine the laws of human mortality by Dr Percival, [§] Dr Dobson, [||] Dr Price, [¶] and Dr Heysham; and soon after Dr Joseph Clarke, [**] of Dublin showed how these inquiries might be applied to furnish facts relative to the statistics of the births of the human race.

---

[*] Natural and Political Observations on the Bills of Mortality in London, by Captain John Graunt. London, 1665 and 1676.

[†] Philosophical Transactions, Vol. xxxii. p. 224.

[‡] Phil. Trans. Vol. xxxii., and an Account of the success of inoculating the Small-Pox in Great Britain, for the year 1726. By James Jurin, M. D. Physician to Guy's Hospital. London, 1727.

[§] Medical Observations and Inquiries, Vol. v. p. 272, and Essays Medical, and Experimental. London, 1767, Vol. ii., and Phil. Trans. Vol. lxvi. p. 322. Lond. 1775.

[||] Med. Obs. and Inquiries.

[¶] Philosophical Transactions, Vol. lix. p. 89. Lond. 1769. And Vol. lxv. p. 424. Lond. 1775.

[**] Philosoph. Transactions, Vol. lxxvi. Lond. 1786. Also Observations on Reversionary Payments.

At a subsequent period the cultivation of a particular form of statistical information was undertaken by Sir John Sinclair, who, with great perseverance, contrived, by the aid of the Clergy of the Church of Scotland, to collect a large quantity of important and interesting matter, relative to the state of the 938 parishes into which the ecclesiastical state of Scotland is divided; their population, the respective pursuits of each; the average number of births, deaths, married persons, and those living in celibacy; the rate of wages, the price of provisions; the prevailing diseases; and, in short, every set of facts tending to throw light on the natural, civil, and social history of the country. * This was for the time a great and useful undertaking; and though from the multiplicity of hands by which its parts were performed, it was very unequal, and from the difficulty of obtaining the separate accounts in due season, its arrangement is irregular, the Statistical Account of Scotland must always be regarded as a most useful repertory of facts for the time at which it was produced. It ought also to be observed, that though the labour of the details of the individual parishes belongs very generally to the clergymen of the church, yet to Sir John Sinclair pertains all the honour of devising, commencing, and carrying into ultimate execution, an undertaking, which, but for his powers of indefatigable perseverance and energetic concentration, must have been suffered to evaporate in idle wishes and inefficient efforts.

It must be further gratifying to every lover of useful knowledge to think, that the laborious, and, in several respects, defective attempt of the departed indefatigable Baronet, if it has not been directly useful, yet is now likely to be of infinite and lasting service, in giving a spur to statistical inquiry, and, above all, in giving origin to a New Statistical Account of the parishes of Scotland, which, we are enabled to say, from the length the work has already proceeded, and the specimens now before the public, cannot fail to be the most complete, if not the only one, in Europe. Independent of the arrangement being methodical, in so far as the parishes are classified according to the counties to which they belong, the New Statistical Account is distinguished for a much more judicious spirit of selection in its materials, a much clearer and more comprehensive subordinate arrangement, the rejection of all nugatory or superfluous matter, correct accounts with numerical statements of the different forms of social industry, and in short, concentrated but clear views of all those matters, the knowledge of which can illustrate the internal economy of a country. In two circumstances, indeed, we think that the New Statistical

---

* Statistical Account of Scotland, by Sir John Sinclair, Bart. 1793–1797.

Account will be pre-eminent above every work of the kind,—one, the more full and correct natural history account of the natural products of the respective parishes,—and the other, in more correct statements than any yet given of their politico-economical relations.

Another proof of the increasing taste for these inquiries, and what must eventually tend much to promote their efficiency and success, is the establishment of statistical societies in various large towns and cities. The only one of the existence of which Scotland can hitherto boast, is that of the city of Glasgow, and the county to which this city belongs, the first part of the Transactions of which are now before the public. This society was first established in April 1836; and it is a remarkable proof of the influence of the exertions of a single individual, in giving an impulse to a particular branch of inquiry, that Glasgow has been thus the first of Scottish cities to have a society for the purpose of promoting and encouraging statistical researches. Dr Cleland, the author of the principal portion of the Transactions at present before us, has been long known as a most indefatigable and pains-taking collector of statistical facts; and it is not without reason that the first article in the Transactions of the Glasgow and Clydesdale Statistical Society, is an account of the former and present state of the great commercial and manufacturing emporium of the West of Scotland, and that it is the work of the most eminent of statistical authors of whom Scotland can boast.

It does not detract from the value of the present memoir, that the greater part of it, and all its most material and important facts are already before the public, in the account of the City of Glasgow, in the new edition of the Encyclopædia Britannica. By all impartial judges that will be regarded as a credit to the work in which it is contained, and, at the same time, as a means of diffusing more widely, than in all probability could be effected by any other means, the knowledge of the interesting and important facts contained in the present memoir. These facts furnish an instructive, and at the same time, amusing view of the present state of the great metropolis of the west of Scotland, compared with its former condition; and show what immense progress may be made by persevering industry, the judicious application of capital, and that sagacious prudence which knows how to avail itself of times and opportunities.

Our limits will not permit us to enter at length into the memoir of Dr Cleland; neither do we think that such a proceeding would be the right one. It is impossible, on the one hand, to communicate any idea of the value of the information here recorded, otherwise than by attentive perusal; and, on the other, many of the matters discussed come not within our sphere. There are, however, a few points which more immediately interest medical readers, and a few of these we may select for notice.

The first point is the population. Till the beginning of the eighteenth century, the population of Glasgow was only about 12,000; but a little past the middle of that century it had nearly doubled, having then amounted to 23,516. It went on increasing with much greater rapidity during the latter half of the eighteenth century, having again doubled about 1786, and at the close of the century amounted to 77,385,—or considerably more than triple what it was in the middle of the century. The census of 1811 made it 100,749, and the last census of 1831 made it 202,426, so that the population was doubled in the space of twenty years. During 1836, it is rated at 244,000.

As the number of burials certified for the same year amounts to 5185, this gives a rate of mortality of 1 in 39.04. This is rather higher than England generally, and the most salubrious parts of Europe, which falls so low as 1 in 50. In the rate of mortality, indeed, Glasgow makes an approach to the least injurious of the fenny districts in England, as Essex, in which it is 39.10. With the increase of population, however, the mortality increases in a greater degree. With a population estimated at 244,000, the mortality is rated in 1836 at 1 in 28.906.

It is true that the mortality in England and Wales for 1821 is stated at 1 in 39$\frac{3}{5}$, and for 1831, 1 in 39$\frac{4}{5}$, while that of Sweden and the southern provinces of France is stated at 1 in 40, and in the northern provinces at 1 in 44. Our correspondent, Mr Marshall, has, in his last article, stated the mortality in England to be only 1 in 50. In the most insalubrious marshy districts, as Kent, Cambridgeshire, and Lincolnshire, it rises so high as 1 in 33½, or 3 per cent.

Under this head one curious statistical document may be noticed, interesting at once in a moral and politico-economical point of view. Our readers will remember that we had occasion to observe, in our account of the researches of M. Parent du Chatelet, on the extent and state of prostitution in Paris, that, from various causes, the estimate of the number of females referable to this head living in London had always been much overrated. We did not then add, that, from various circumstances, M. Parent du Chatelet was disposed to rate them at not higher than from 8000 to 10,000. In Glasgow, we find that in this division of police, a very high degree of accuracy has been obtained, chiefly in consequence of the exertions of Dr Cleland, in obtaining correct reports and returns to various questions proposed by him, and partly also owing to the activity of Captain Graham, and his courtesy in facilitating the necessary inquiries. From a minute survey made in November 1831, under the latter gentleman's authority, by the three principal criminal officers, returns and information were procured, which enabled Dr Cleland to construct the following table of the number of houses to which dissolute and suspicious persons of both sexes resort.

In ten parishes of the royalty, November 1831.

No. mal. keeping public-houses.	No. fem. frequent ing the same.	No. fem. keeping public-houses.	No. fem. frequent ing the same.	No. mal. keeping private houses.	No. fem. frequent ing the same.	No. fem. keeping private houses.	No. fem. frequent ing the same.
29	622	6	110	63	527	152	905

29	6	622	527
63	152	110	905
92	158	732	1432

Male householders, 92, female householders. 158, .	250
Females living in or frequenting disreputable houses, .	2164
Total males and females, . .	2414

And including the suburban parishes of the Barony and Gorbals, the criminal officers came to the conclusion, that the number of females who, in Glasgow, frequent disreputable houses for criminal purposes, was considerably above 3000. As the total number of females in the population was, by the census of the same year, known to be 108,702, it results that one female in every 36 in Glasgow is a person of loose life and conversation.

The table further suggests some curious inferences in a statistical point of view. It appears that the disreputable houses kept by males are, for their number, frequented by the greatest number of female visitors, each having at an average 29½. It further appears that the smallest number of disreputable public-houses is kept by females; and the greatest number of disreputable private houses; that the first class is frequented by the greatest number of females next to that of the public-houses kept by males, this number amounting at an average to 18⅓; and that the private houses kept by females are frequented by the least numerous body of these women, there being on an average 5 girls with a fraction, approaching to 6, to each house of this description.

The public medical establishment of Glasgow consists of an Infirmary, capable of accommodating 397 patients, medical and surgical; a fever hospital, capable of accommodating at least 108; a workhouse or public hospital for paupers, capable of accommodating 335 persons, with about 38 or 40 patients; one public lunatic asylum; and one private at Garngad House, capable of containing between them 190 patients; and a lock hospital, capable of accommodating 15 or 16 female patients. To this must be added the fact, that the sick poor of the whole population are partitioned, according to their districts of residence, among twelve district surgeons, who visit at an average upwards of 5000 poor persons annually at their own houses.

In our account of Dr M. Buchanan's History of the Glasgow Royal Infirmary, we gave several numerical statements regarding the revenues and expenditure of that institution, the number of cases treated, the proportion of mortality and other points of interest; and to this we have little on the present occasion to add.

The prevailing diseases requiring medical treatment, are, according to the numbers in the Infirmary returns, rheumatism, 71; diseased heart with dropsical infiltration, 58; consumption, 57; bronchitis, 52; erysipelas, 45; pneumonia, 42; dyspepsia, 35; palsy, 31; enteritis, 27; pleurisy, 21; diarrhœa, 17; diseased heart, 17; anasarca, 17; diseased kidney with dropsy, 15; dysentery, 15; tonsillitis, 14; diseased liver, 12; cephalgia, 12; anasarca and ascites, 12; sciatica, 12; spinal irritation, 11; pleurodynia or intercostal rheumatism, 10; diseased liver with anasarca and ascites, 9; jaundice, 9; gastrodynia, 8; hysteria lumbago, pleuropneumonia, and ovarian dropsy, each 7. The residue are too small to require specific notice.

The most frequent diseases in point of number requiring surgical treatment, are ulcers, 147; burns, 62; bruises, 53; abscesses, 43; disease of knee-joint, 27; fracture of femur, 26; periostitis, 19; synovial inflammation, 17; fracture of humerus, 15; fracture of the neck of the femur, 14; fracture of the clavicle, 14; fracture of the tibia and the tibia and fibula, each 13; orchitis, 12; urethral stricture, 12. The others are too small in number to merit notice.

With regard to the mortality in the Royal Infirmary and Fever Hospital of Glasgow, the following statement of facts deserves attention. During the five years preceding 1836, the average annual mortality by all diseases amounted to 311, of which 6 were by small-pox, and 147$\frac{4}{5}$ by fever. During the year 1836, however, a great increase in the mortality took place, chiefly, as the numbers demonstrate, in consequence of the increased prevalence and mortality either of typhous fever, or fever with local inflammation. The following numbers under each head show the relative amount of mortality by each.

Ordinary medical and surgical diseases in the Royal Infirmary Fever Hospital,		207 Deaths.
Typhous fever, - -	380	
Small-pox, - - -	45	
Scarlet fever, - - -	5	
Measles, - - - -	3	
Febrile diseases with local inflammation,	65	
		498
		705

From this it results that the mortality in 1836 was much more than double of the average of the five previous years. The great number of deaths by small-pox, not fewer than 45, is very remarkable.

With the knowledge of this great increase in sickness and mortality, it is not unimportant to connect the comparative increase of expenditure thereby incurred. It appears that, in 1835, the income of the establishment was L. 5599, 4s. $1\frac{1}{2}$d., and that the expenditure was L. 5332, 0s. $2\frac{1}{2}$d., leaving a balance of income over expenditure amounting to L. 267, 3s. 11d. In 1836, on the other hand, the income was only L. 5112, 16s. 11d., whereas the expenditure amounted to L. 6135, 6s. $8\frac{1}{2}$d., showing an excess of expenditure above income of L. 1022, 9s. $9\frac{1}{2}$d.

During 1836, the average duration of the residence of each fever case in the Infirmary was 18 days; of each ordinary medical case 29 days; of each surgical case 34 days; of each patient of every kind taken indiscriminately, 23 days.

The great increase in sickliness is also shown by comparing, as in the following table, the number of patients admitted during 1835, with the number of those admitted during 1836.

	Admitted.	*Dismissed or Dead.*	*Average Residence.*
1835,	3274	3260	254
1836,	5253	5130	327
Increase,	1979	1870	73

It may be proper to mention, that the difference between the number of cases admitted, 5253, and that of those dismissed or dead, viz. 5130, viz. 123, is accounted for in a note by Dr Cleland, by saying that, from various causes, these were not treated.

The proportion of deaths to the cases treated has been greatly above the usual averages for previous years. Thus, in fever cases, it is 1 in $6\frac{3}{10}$, in ordinary medical, 1 in $6\frac{4}{5}$, in surgical cases, 1 in $15\frac{1}{5}$, and for all patients taken indiscriminately, 1 in $7\frac{6}{10}$. The expense of each patient, including his share of repairs, furniture, incidental expenses, salaries, medicines, and provisions, is L. 1, 3s. 11d. Each bed constantly in use throughout the whole year, including salaries, medicine, and provisions, cost the institution L. 15, 3s. 2d.

The mortality here stated differs very little from that still more recently given by Dr Cowan in an able statistical report on Fever and Small-Pox, in Glasgow, to which we shall take an early opportunity of directing the attention of our readers. That gentleman makes it 1 in $6\frac{3}{4}$, or somewhat more than 14 per cent. among males, and 1 in $11\frac{1}{8}$, or nearly 9 per cent. in females, or 1 in 8 for both sexes.

Dr Cleland gives several other tables, which furnish instructive information on the diseases that are most prevalent, and those which are most fatal in this large and dense congregation of human beings. Thus, in the Town's Hospital, an institution like our Charity Work-House, which contains a population of 335 inhabitants, disease, medical, surgical, or mixed, occurred in 613 cases, we presume, in the course of a single year; and 79 deaths took place. The most prevalent disorders were, according to the numbers, in the order now specified, ophthalmic affections, 48; bowel complaint, 47; insanity, 46; fever, 45; dropsy, 39; age and debility, 38; catarrh, 30; epilepsy and rheumatism, each 25; hernia, 18; and apoplexy 16. The most frequent causes of fatal termination are, age and debility, 16; apoplexy, 15; bowel complaint, 14; dropsy and diseased heart, 10.

Among the list of disorders treated by the district surgeons in twelve different localities of Glasgow, while fever occupies the most prominent place, being 1371, or nearly one-fourth of the whole, next in order come catarrh, 695; dysentery, 144; hysteria, 130; rheumatism, 124; scarlet fever, 124; age and debility, 120; consumption, 107; pleurisy, 104; dropsy, 96; small pox, 95; constipation, 90; dyspepsia, 70; measles, 67; tonsillitis, 66; and rose, 54. Among these only 45 deaths took place; but we are not informed as to the diseases by which the fatal termination was effected.

Mental disorders seem to be rather abundant. At least the number of persons silly and idiotical is not small, the former being 88, and the latter 35. Of the number in the Lunatic Asylum, and the private establishment at Garngad House, for acute forms of mania and monomania, amounting to 190, we take no account; because we know that persons are sent to both establishments, not only from the whole county of Lanarkshire, but from several adjoining, and even occasionally remote towns and counties.

In speaking of small-pox and its mortality, we fear that some mistake has crept into the numerical statement of that disease. It is said at page 72, that, among the deaths taking place in the fever house, in 1836, 45 were occasioned by small-pox. This we have already noticed as a large number from such a cause. It is afterwards stated at page 78, that the admission of small-pox cases into the Infirmary amounted in 1836 to the number of 45. This, it is obvious, makes it appear, that the whole of the cases admitted died,—a result which we think not to be likely; and we therefore beg to suggest, whether the number admitted was not greater than 45, or whether the deaths really amounted to this number.

We have thus noticed the most important and interesting points in this valuable memoir; and cannot conclude without saying that, as a statistical document, it is quite a model, and will doubtless be perused with great advantage by all who wish to understand correctly the internal economy of this large city.

A similar memoir on the statistics of Edinburgh would be a great acquisition.

ART. IX.—1. *The Retrospective Address upon Medical Science and Literature, delivered at the Fourth Anniversary Meeting of the Provincial Medical and Surgical Association, held at Manchester, July 21st,* 1836. By JOHN GREEN CROSSE, Esq. F. R. S., &c. Worcester, 1836. 8vo. pp. 88.

2. *The Retrospective Address, delivered at the Fifth Anniversary Meeting of the Provincial Medical and Surgical Association, held at Cheltenham, July* 19*th and* 20*th*, 1837. By JAMES L. BARDSLEY, M. D., Physician to the Manchester Royal Infirmary, &c. Worcester, 1837. 8vo. pp. 55.

MORE than once have we had occasion to speak in terms of warm approbation, both of the object of the Provincial Medical and Surgical Association, of the manner in which it is conducted under the care of its zealous and indefatigable founder, and of the beneficial influence which it exercises on the medical profession in England. It gives us sincere pleasure to perceive, that this commendation continues to be well merited, and that the institution continues to thrive, and to extend the sphere of its benevolent and useful labours. It has now published five volumes of Transactions, containing several exceedingly valuable memoirs and essays, and is in the course of publishing a sixth. Its anniversary meetings continue regularly to be attended by large numbers of the most able and best informed practitioners in England; and these meetings serve at once as a centre of reunion, and friendly intercourse between all the members, and to foster and promote a spirit of observation and inquiry, and of mutual communication among the different ranks and orders of the profession.

Of all the useful features of this Institution, the practice of the annual address is, next to that of the collection and publication of Transactions, by far the most important. A member of the Association, of known character, abilities, and information, is selected at each anniversary meeting, and to him is consigned the honourable duty of addressing his fellow-members at the ensuing meeting, taking a short view of the progress and improvements of medicine and surgery as sciences and arts, during the past twelve months, giving such information, and making such remarks as correct judgment may suggest, regarding the state of the medical profession, and any measures or plans which may have been taken likely to influence its welfare. The effect of such addresses it is easy to understand. The minds of practitioners are gently and imperceptibly withdrawn from the trading details and drudgery of practice, and are elevated for the time to the scientific part of the profession; the speculative recluse is compelled to look into the world, and view himself as an integrant part of the great general community; and all are inconsciously and involuntarily led to forget individual and local interests, and to concentrate them in the great general object of promoting the honour, the interests, the dignity, and the utility of medicine and its professors.

The two addresses now before us are justly entitled to the attention of every member of the medical profession on the grounds now stated. The one is delivered by an eminent surgeon, and the other by a distinguished physician, each different in the subordinate subjects treated, but each agreeing in the general character now given.

The address of Mr Crosse, though embracing the different departments of medicine, is, however, more full and detailed on the subjects of surgical pathology and operative surgery. The author begins by a just encomium on the value and importance of healthy anatomy, as the basis of all correct medical knowledge, and notices briefly the principal new discoveries in that department. He then impresses the utility of the provincial medical schools, and passes rapidly to the necessity of giving publicity to the returns from the British army at home and abroad, as to the prevailing and most mortal diseases. Physiology and pathology, therapeutics and materia medica, successively claim attention, in all of which the author evinces intimate and extensive acquaintance with all the new principles and new remedial agents recently proposed in the treatment of disease. A severe and well-merited censure is passed on the homoeopathic doctrine. The author then enters on his own subject of surgery, and takes a full and correct view of all the recent improvements in surgical pathology and therapeutics, whether by treatment or by manual operation. Midwifery, and the physiology and pathology of utero-gestation, next come under review, and afford the author an opportunity of placing before his audience a great assemblage of curious and valuable information. This is followed by some judicious observations on the state of medical literature, the profusion of medical writings, and the state and influence of the periodical press. On the latter subject Mr Crosse makes some very sensible and just remarks, which, for the sake both of the honour and the true interest of the profession, we should wish to see more generally known. With the opinion of Mr Crosse, as to the pernicious influence of all ephemeral and temporary controversies in medicine and surgery, all personal abuse and animosity, every individual of sound judgment and correct taste must agree.

The address of Dr Bardsley, though more strictly medical, is not less interesting and instructive. The author first enumerates shortly the discoveries and accessions in anatomy and physiology, then gives a more minute view of those in medical pathology and therapeutics, and in his account of both shows at once judgment, ingenuity, and clearness of method. The progress of surgery having been, in the address of Mr Crosse, so minutely detailed, Dr Bardsley merely notices a few improvements. In the obstetrical department, he gives the particulars of a singular case of monstrosity, illustrated by a very good coloured engraving. Dr

Bardsley then adverts to the epidemic influenza, so severe and fatal in this country last season, and the appearance of cholera in Vienna; under the head of Statistics, he pronounces a just encomium on the works of M. Parent Du Chatelet; and then mentions, and characterizes with great justness, the most important new works on medicine, surgery, and pathology, published in the course of the year. This is succeeded by short and well-written biographical notices of the late Dr Henry of Manchester, Dr Turner of the London University College, the veteran Hufeland, Dr John Johnstone of Birmingham, and his own hospital colleague, Mr Ransome of Manchester, all of whom paid the debt of nature during the last twelve months. These sketches are conceived and written in a happy spirit of correct feeling towards departed worth.

In the last part of his address Dr Bardsley takes a view of the present state of Medical Education, considers its capabilities and defects, and points out the means of its improvement. And here we must say that Dr Bardsley shows that he thoroughly understands the subject, and has rendered, by the publication of the remarks contained in the present address, a very great service to that most important cause. He touches with great judgment and delicacy the defects of the courses prescribed by different licensing and examining boards, specifies with civility but firmness the means of improvement, and shows by his suggestions, that he has at once studied the subject with extreme care, and in the most dispassionate manner, and that he knows what is practicable and expedient, and what is impracticable and inexpedient, under the circumstances. Here are no chimerical and absurd propositions, such that they defeat their own intention. But all is proposed in a cool, rational, and sensible manner, and the propositions are supported either by arguments so irresistible, or experience so decided, that they carry conviction with them. It was our wish to have given here Dr Bardsley's remarks on the education of surgeons and general practitioners, at p. 42 and 43. But, as our limits will not allow, we must be satisfied by recommending in general though strong terms the attentive perusal of this part of Dr Bardsley's address. It is sufficient to say, that he urges strongly the attentive study of physiology, pathology, clinical medicine and surgery, and comparative anatomy, for all the branches of the profession, and that for the general practitioners he suggests the advantage of abridgement of the period of apprenticeship, and more extended study of the elementary departments.

We have only to express the hope, that the present address shall be generally perused by the members of the profession in England. We think its sentiments will find an echo in their own breasts; and we are sure, that the suggestions therein given, must tend to the accomplishment of the object for which we are all anxious,—the honour and interest of the medical profession.

PART III.

MEDICAL INTELLIGENCE.

VEGETABLE PHYSIOLOGY AND CHEMISTRY.

On the Yellow Colour of the Leaves in Autumn. By BERZELIUS. (Annalen Der Pharmacie, Vol. xxi. st. 3. p. 257.) It is well known that the green foliage of trees assumes before falling in autumn, especially after one or more nights of frost, a beautiful citron-yellow colour. This is particularly observed in the beech, *Betula alba;* the pear-tree, *Pyrus communis;* the apple-tree, *Pyrus Malus;* the elm, *Ulmus campestris;* the ash, *Fraxinus excelsior,* &c. The foliage of the alder, on the contrary, rarely becomes yellow but falls green. That of the oak becomes not yellow but brown. The yellow foliage afterwards assumes the same brown colour when it is dried after its fall. Various researches have already been made on the yellow colour of the foliage. Macaire Prinsep communicated the result of several experiments on the autumnal coloration of the foliage; and the general conclusion is, that the foliage in autumn ceases to evolve oxygen, but that it takes this gas from the air, that there is then formed an acid which tinges the foliage at first yellow, then red, and that this acid may be neutralized by an alkali, so that the foliage recovers its yellow colour. Like Clamor Marquart, he regards these colorations as modifications of one and the same colouring matter, which he terms *chromule;* and he says, that it is the cause of the ordinary yellow or red colour of the petals. These results Berzelius represents to be quite incorrect. Foliage once tinged yellow never becomes green under any reagent; but foliage which has become red, resumes a green colour on the addition of potass, because its red colouring matter forms green combinations with this alkali. Leopold Gmelin first directed attention to the difficulty with which the experiments of Macaire Prinsep could lead to precise results. Guided by this observation, Berzelius undertook some researches on the colour of the foliage altered by the agency of the autumnal cold. These he performed chiefly on the citron yellow foliage of the common pear-tree *(Pyrus communis)*, which was put recently and at the moment at which it was collected in a bottle, and completely covered with alcohol of 0.833, with which it was left in contact for forty days. The alcohol acquired a yellow colour; but the foliage was still yellow, though paler than before. The alcohol was decanted, and the flask was kept for some time inverted. The foliage then acquired a brown colour, wherever it was contact with the air, while the sides of the leaves which were in contact with the walls of the vessel, retained their yellow tint. Alcohol was poured at several intervals on the leaves, and each time was coloured yellow. At length the alcohol was made to boil, when it acquired a colour a little yellowish, but it became gelatinous during cooling.

The cause of this gelatinous state is the presence of a fatty matter, peculiar probably to the foliage examined, which is obtained colourless after washing with cold alcohol, from new solutions and renewed washings. It possesses the following properties. In the dry state it is of a milky white, its fragments similar to chalk. It becomes soft under pressure; it is inodorous and tasteless. It melts at 73°, and becomes concrete and turbid on cooling. Insoluble in water, it requires 425 parts of cold alcohol to dissolve it. A saturated solution at boiling heat is converted, on cooling, into a transparent jelly-like paste. Cold ether dissolves little of it but more than alcohol. It is insoluble in caustic potass. It passes without change to the dry distillation, if, during the process, air be excluded.

The leaves, macerated as now described, were distilled to one-eighth; and there was then deposited, on cooling, a granular substance, which presented a species of crystallization. After the separation of this substance, the distillation was continued till nothing was left but the water of the vegetation of the leaves. On this yellow-brown liquor was then floating a yellow soft fatty substance, with an appearance identical to that of the grains containing the yellow colouring matter of the foliage. These grains presented to the microscope no trace of crystallization, and they might be drawn by the fingers into a yellow unctuous fat. This is mixed with a small quantity of fat oil, which Berzelius could distinguish but not isolate with certainty, and with another substance equally as fat. It could be detached in greater degree from the first substance, by digestion with a weak solution of caustic potass, which saponifies the oil and dissolves only a small quantity of the yellow fat. The yellowish fat acids are precipitated from the alkaline solution by hydrochloric acid, and by redissolving them in very much diluted caustic ammonia (five or six drops of the *aqua ammoniæ* to one ounce of water), and again precipitating them, they are obtained colourless. To deprive it of the last substance, or the solid fatty matter, it is necessary to treat it with cold alcohol, in which it is not soluble. He was, however, never able to obtain it completely free from these two fat substances.

Obtained in the manner now described, it is under the form of a yellow fat, unctuous, easily fusible, and already liquifying at 42° Centig. (108° Fahr.); it then becomes concrete, translucent, and yellow-brown, sparingly soluble in alcohol, and leaves a carbonaceous residue. In water it is insoluble; but if hot water be poured on it, when melted, it becomes transparent, swells up slightly, and assumes a paler yellow tint, as if water combined with it chemically. When it is bedewed with water and long exposed to air and light, it is completely bleached, and is converted into a fat not easily soluble in alcohol, and which is precipitated in light white flakes from a saturated alcoholic solution at boiling heat.

The yellow fat is soluble in alcohol, though in small quantity. In this solution it is not sensibly whitened at the same time as it begins to whiten with water. The alcoholic solution furnishes a precipitate on the addition of water; it then assumes a pale milky-yellow aspect, with difficulty becomes clear, and also preserves this state after the evaporation of the alcohol. From the alcoholic solution it is deposited by spontaneous evaporation under the form of a granular crystalline mass. It is copiously dissolved by ether, and it remains after the evaporation of the solvent, transparent, and of a yellow colour. In contact with concentrated sulphuric acid, it becomes brown, is sparingly dissolved, but with alteration, and furnishes then a brown-yellow liquor, which is precipitated by water in a white gray. In caustic potass it is very sparingly dissolved, and exposed in this solution for some time to the influence of air and light, it is bleached. From the solution in potass it is precipitated by acids in pale-yellow flakes, which, if properly washed, do not redden turnsol infusion. In carbonate of potass it is little or not at all soluble, and insoluble in caustic ammonia, to which, nevertheless, it imparts a yellow colour.

This yellow colouring matter is therefore a peculiar fatty substance, intermediate between the fat oils and the resins, which may be bleached, retaining, however, its property of being with difficulty soluble in alcohol, and of being fat and unctuous. To this Berzelius proposes to apply the epithet of *xanthophylle*, from ξανθος, yellow, and φυλλον, leaf or foliage. He thinks there is every reason to presume that in the disappearance of the green colour and its conversion into yellow, the latter arises from the green by virtue of a change in the organization of the leaf affected by cold, and which modifies the organic process. He has in vain, however, attempted to reproduce the green colour with the yellow; and he has been equally unsuccessful in converting the green into yellow.

The brown colour of the foliage presents no common character with the yellow. It is produced by an extractive principle, at first colourless, which, after the disorganization of the epidermis of the foliage, becomes brown by the action of oxygen, and then communicates to the fibre of the skeleton of the foliage a brown tint, which cannot be removed even by digesting it with a weak solution of caustic potass, and cannot be destroyed by long-continued treatment with sulphuretted hydrogen.

On the Red Colouring matter of the Fruits, and on that of the Leaves in Autumn. By Berzelius. (Annalen der Pharmacie, Vol. xxi. 3, p. 262.) —1. *Red Colouring Matter of the Fruits.*—The red colouring matter of several kinds of fruits has in general been regarded as a blue colour reddened by an acid. This may be the case as to the colour of several fruits; but all are not in the same predicament; and, consequently, the colouring matter of those which form the exception, ought to be determined separately. Berzelius examined the colour of the cherry (*Prunus cerasus,*) and of the black-currant (*Ribes nigrum,*) and found both to contain the same colouring matter, and the latter to be not blue. This presumption, perhaps, proceeds from the fact, that the juice of these fruits gives with acetate of lead a blue precipitate. These precipitates, however, are malate and citrate of lead, with which the colouring matter is combined, and the latter may be withdrawn from it, still slightly mixed with free acid, by a soluble quantity of sulphuretted hydrogen; and, after the separation of the acids, it is as to be now described.

To obtain it pure, it is requisite to separate the acids completely; and the best agent for this purpose is chalk in fine powder, which causes a deposit of malate and citrate of lime. Small quantities of lime are then added, in order to precipitate the neutral malate of lime contained in the liquor, which is next filtered and mixed with a little acetate of lead, when the green-blue then formed is separated, because it contains, perhaps, also malate of lead, and whatever is in solution in the liquor is precipitated by acetate of lead.

The green precipitate is collected on a filter, and washed in such a manner that it may be always covered with water to prevent the access of air. It is then decomposed by sulphuretted hydrogen; the filtered liquor is evaporated *in vacuo* over sulphuric acid; the colouring matter left is dissolved in anhydrous alcohol; while the latter leaves undissolved the colouring matter altered by the air, and pectine or pectic acid. By distilling the alcohol, and desiccating the residuum *in vacuo*, the colouring matter is obtained, in the form of a beautiful red transparent brilliant mass.

Much loss is sustained in determining at first in the juice of these fruits by the aid of acetate of lead, the presence of a blue precipitate of malate and citrate of lead, then precipitating the colouring matter and the filtered liquor by the subacetate of lead, and decomposing the washed precipitate by sulphuretted hydrogen. In this state the colouring matter is soluble in all proportions in water and in alcohol, but insoluble in ether. After evaporation of its solution in the sand-bath, it remains aqueous; but there is formed a deposit less soluble in water, and very little soluble in alcohol, viz. another red colouring matter less alterable; if to a solution of the colouring matter in water there be added a little milk of lime, a gray-green combination is precipitated. The colouring matter not yet precipitated is red, but of another shade, because it contains a combination of lime with excess of colouring matter. If the natural colour of the latter were blue, its solution would be blue, and not red, because then every free foreign acid is saturated. The colouring matter, on the contrary, forms, as has been seen, a combination with the malate and the citrate of lead, and the latter is of a beautiful blue colour; but this colour presents nothing of the particular shade of the colouring matter. The solution of the latter in alcohol may be preserved without being oxidated. Nor is it oxidated so long as it remains in contact with the free acid in the juice of fruits. The brown-red deposit is feebly soluble in water, to which it imparts a deep-red colour, while potass dissolves it with a deep-brown colour. It forms with ammonia a neutral soluble combination, and another acid insoluble, or sparingly soluble, coloured red-brown. The green neutral combinations of the pure red colouring matter are changed in the moist state, at the expense of the air, into this brown combination. The precipitate of lead, however, constitutes an exception, since it is preserved during washing and desiccation. Berzelius adds, that he has preserved for sixteen years without change the green precipitate obtained from the fruits of the mountain ash, (*Sorbus aucuparia*) by the subacetate of lead, after having previously separated the malic acid by means of carbonate of lead.

2. *Red Colouring matter of the Leaves in Autumn*. The foliage of certain leaves is observed in autumn to become red. All the trees and shrubs on which Berzelius observed red leaves, bear also red-coloured fruits, for instance the mountain ash, (*Sorbus aucuparia*); cherry, (*Prunus cerasus*); gooseberry, (*Ribes grossularia*) var. *rubra*; the barberry, (*Berberis vulgaris*), &c. The red colour contained in these leaves is so near to the preceding that it may be pronounced identical. Berzelius, nevertheless, examined only the red colour of the foliage of the cherry-tree, and especially the red gooseberry, the leaves of the last of which often become so red, that they have completely the aspect of ripe fruits. Their colouring matter was extracted by alcohol, which, after distillation, left a red liquor, which was separated by filtering from a resin and a fatty substance precipitated. The filtered liquor was mixed with water, which was effected without turbidity, and then with neutral acetate of lead, in which there was formed a precipitate of a beautiful grass-green, which, at the end of some seconds, assumed a gray-brown colour; and acetate of lead was then added until the precipitate no longer changed, and that last obtained preserved its green colour. It was then separated by the filter, and what was left on the latter is a combination of oxide of lead with the vegetable acids of the leaves, and with a brownish colouring matter, which is formed at the expense of the air, into red solutions, alcoholic and aqueous. The residual colouring matter was precipitated with a beautiful grass-green colour by means of acetate of lead, collected in a filter well washed, decomposed by sulphuretted hydrogen, and evaporated *in vacuo* to dryness. The solution precipitated by acetate of lead still furnished a small quantity of green-yellow precipitate, when free acetic acid had been there saturated by subacetate of lead. From this precipitate was obtained a colouring matter entirely similar to the preceding.

This colouring matter, to which Berzelius gives the name of *erythrophylle*, from ερυθρος, red, and φυλλον, a leaf, were it only probably that of the fruits while it is demonstrated to be so, is in aspect and chemical properties similar to that of the cherry and the black currant; and differs from them only slightly in the shade of colour, which is a deeper red, and inclines more to the blood-red, and in the property which it possesses of forming green in yellow combinations, while those of the colouring matter of the cherry and grape are green or blue. The deposit formed by the evaporation of its solutions is of a clearer brown-red than that of the preceding, and gives with the bases clearer brown-red combinations, which do not so readily assume in the air a deep shade, than that of the fruits. But whether these shades belong to the deposit of the colouring matter in the leaves, or are peculiar to the colouring matter of the red gooseberries, which Berzelius did not examine, he knows not. The red colouring matter of the leaves half precipitated by lime-water, gives a green precipitate, while the liquor acquires a paler red tint. Thus this colouring matter can no longer be regarded as originally blue.

PHYSIOLOGY.

A new mode of increasing the Heart's action for restoring the powers of life in persons apparently dead from drowning, or in syncope. By John Hyslop, Esq. Surgeon. (From Dr Wardrop's Work on Diseases of the Heart.) Some years ago, I had occasion to bleed a lady, and abstracted upwards of thirty ounces of blood, whilst she was in bed. About three hours afterwards, on attempting to rise she fainted. The family being in great alarm, I was sent for, and when I got to the bedside, I found that another practitioner was in attendance. He said to me "your patient is dead." The basin of blood remained still on the table, and I was in great uneasiness on account of the lady's condition, and I confess I also dreaded the effect of the largeness of the bleeding. Spirits of ammonia had been sent for, but deglutition was suspended; a flexible tube was sent for, and I became very much alarmed.

In this state of anxiety of mind, and without having any precise purpose in view at the time, I desired her husband, who was almost frantic, to assist me in raising up her head and shoulders from this supine position. She gradually resuscitated, and in three or four minutes she became quite revived. I again visited her late at night, when she said she had great pain in her arms, and she thought that her husband and I had grasped her arms too tightly. On returning home and reflecting on the circumstances of this case, I concluded that pressure (quite unintentional, however,) on the brachial arteries, by impeding the circulation and causing congestion, must have excited the action of the heart.

On making the experiment, I found, that by pressing the brachial artery, the pulse, though it gradually beat faster and faster, continued still small and thready, and when the pressure was removed, it became very full and continued so for some time.

I can at any time raise the pulse in this way. On repeated trials, I find that the pulse being first felt so as to ascertain the progress of the pressure, it runs nearly thus:—

In 3½ minutes it rises from 68 to 74
5 - - - 68 to 78
7 - - - 68 to 80

So that in seven minutes, twelve beats in the minute can be gained. Is there any medicine known which can do this in so short a time? How valuable, then, is this fact!

It was only yesterday that an eminent anatomist called on me. He doubted the fact. I convinced him by stopping the circulation in his right arm, when in nine minutes his pulse rose to fourteen beats in the minute. I measured his pulse, it was,—

75, and in 3½ minutes it rose to 83
in 5 - - 85
in 8½ or 9 - 90

As the laws in the animal system sometimes call in the act of pressure, I conclude that to imitate nature in that respect, and in other instances of disease, especially in such as proceed from great exhaustion, they may be (after the knowledge of this fact) successfully treated.

Before I conclude, I have only to say, that if the tourniquet was known formerly to be of use in disease, I can surely affirm it is not used at the present day, nor for the thirty-six years that I have been in practice in London, either at public hospitals or in private practice.

If the patient is thin and delicate, the force of the operator's thumb will be sufficient to produce the necessary pressure. But if the patient be more muscular, a tourniquet must be applied. It may be objected to by saying, " but where is a tourniquet to be had?" A simple and effectual one can be made of a neckcloth or pocket-handkerchief, and a bit of stick, a pencil-case, or the handle of a pocket-knife.

I have, on this occasion, pointed out the good effects to be derived from this practice, as regards a sudden stimulus to the heart when in cases of suspended animation; in cases of persons apparently dead from drowning and in syncope. But much is left to be said of its use in various other instances, where the sanguiferous system requires quick attention, and a remedy fortunately always at hand.

MATERIA MEDICA AND MEDICAL THERAPEUTICS.

Observations on the employment of Gunpowder as a medicine in various morbid states of the Gastro-Enteric Mucous Membrane. By ROBERT DICK, M.D., Glasgow, in a Letter to the Editor of the Edinburgh Medical and Surgical Journal. SIR,—I beg to call, through your Journal, the attention of the profession to the employment of gunpowder, as, in some cases, an useful addition to the already existing stock of medicaments.

I was induced, from theoretical considerations, lately to prescribe it, in certain cases, and had reason to be satisfied with the results.

The derangements for which it appears to me to be peculiarly adapted are morbid secretions of the gastro-mucous membrane, depending on a *sub*-inflammatory action, or accompanied by it.

In such cases, gunpowder, given in various doses, and with the occasional interposition of ordinary mild laxatives, has proved, in my hands, eminently serviceable.

Whether it may be appropriate in a greater variety of cases, or whether it may, if given in larger doses, and for a greater length of time, than I prescribed it, be found useful as a constitutional alterative, or as a cutaneous drug, I am unable to state. But I should not be surprised if it should be found so. I have administered from ten grains, indefinitely upwards, several times in the day.

I find the use of spirituous liquors, or of pungent condiments, &c. rather contraindicated during the employment of gunpowder. The gastralgic effects which I have found these produce, when used simultaneously with gunpowder, I ascribe to what I shall venture to designate the *detergent* effects of that substance on the mucous membrane, which, owing perhaps to its charcoal and nitre, it denudes of its attaching albumino-mucous secretion, clearing, and seemingly *attenuating* that membrane, in some measure.

One advantage of this drug is, that it exists in commeree, ready for medical use.

The best form of administration of gunpowder is in the dry state. The liquid form does not suit.

No apprehensions need be entertained of the charcoal producing any unpleasant consequences. In *pica*, and in the chlorotic state, large quantities of this substance are eaten with impunity; and further, J. P. Frank

[*De Curandis Hominum Morbis*] recommends it as an effectual remedy in flatulence.

The above notices are very general, as the remarks of an individual, who suggests a new drug, ought always to be. I am, Sir, yours, &c. ROBERT DICK.—*Kensington Place, Glasgow, 28th July* 1837.

In speaking of the therapeutic effects of gunpowder in various morbid states of the gastro-enteric mucous membrane and its secretions, it may be not unseasonable to add to the observations now made by Dr Dick, the remark, that charcoal in its separate and pure state has been long used by various practitioners with similar intentions, and to fulfil similar indications in the treatment of ague with gastric, enteric, or dysenteric complication. As a short notice of the use of this substance is given in the Elements of the Practice of Physic by Dr Craigie, without entering into all the details of the history of the introduction of this substance into the practice of medicine, the easiest way perhaps is to quote the account given in that work.

"The exhibition of charcoal for the cure of ague, as a substitute for bark, appears to have been practised in 1813 by Calcagno at Palermo, and afterwards by Dr Calvert, Mr Mackesy, Mr Tully, and other English practitioners, in Sicily, (Med. and Surg. Journ. x. 15, 403); and it was used with that intention by Dr Jackson in the West Indies. In simple ague it seems to produce little or no benefit. But in ague with affection of the gastric, or the hepatic, or gastro-enteric circulation, in ague with anguish at stomach, squeamishness, flatulence, or hiccup, and in dysenteric ague, its sanative influence is unequivocal and powerful. It may be given in doses of from ten to twenty grains in rice-water or arrow-root, either alone or with six or eight grains of rhubarb, and two or three grains of powder of ipecacuan. It appears to operate chiefly by rectifying disordered secretions of the stomach and bowels. It is probably by its charcoal, that the snuff of a candle, which has been alleged to be beneficial in curing ague, as mentioned by Lind, operates."—P. 137.

Mr Law on the use of Arsenic in Plethora.—M. F., aged 37, has for seven or eight years been occasionally subject to violent headach, continuing for some days, and though not always, very generally proceeding to a hysterical paroxysm, which, along with the headach, is only dispelled by free bleedings of from sixteen to twenty ounces of blood, and sometimes a larger quantity.

She is rather above the middle stature, and of a full habit, without much complexion, the bowels apt to be slow, but the necessary aperients regularly employed. She is rather apt to be sedentary, but partakes most sparingly of sleep, or even the recumbent posture, and takes food as well liquid in much less quantity than the average of her own sex, avoiding vinous stimuli almost entirely. Catamenia regular.

Every practitioner summoned to her assistance, wherever she may have been residing, has, from the urgency of the symptoms, been led to the use of the lancet, which alone ever relieved her effectually at the time, the blood flowing with unusual force from the arm when I have had occasion to open a vein in this person. In a few hours after one of these full bleedings, she will leave the recumbent position, proceeding with her usual occupations as if nothing had been the matter. These attacks became of more frequent occurrence towards the end of last spring, when it seemed to me, that as it was next to impossible to diminish the ingesta here, and as the degree of exercise necessary to subdue so strong a disposition to plethora would be of very difficult enforcement, independent of other collateral circumstances in this case, arsenic administered in small doses at the commencement of an attack, would, from its sedative influence on the system, lessen what we were contending against, and for a longer time than the bleedings, which are so apt to demand repetition. Accordingly she had a watery mixture prepared with five minims of the arsenical solution in each teaspoonful, directing her to take a teaspoonful in a little more water, morning and evening, just after a meal, when threatened with an attack, and to intermit it entirely when the tendency disappeared.

It is now six months since the trial was first made, the medicine being, according to these directions, only occasionally employed; nor has she ever since suffered, but in a very slight degree, from what had begun to assume a more alarming aspect. She has on several different occasions in this time found it necessary to have recourse to the arsenic for three successive days, but with the same marked benefit, and what may appear less accountable, the disposition to such a disease has been thus controlled under even some increase of appetite, using rather more food than formerly.

I have been informed that one of her parents died of what has been described to me as apoplexy; but if it was so, and there is a hereditary tendency to cerebral disease, the influence of the medicine in this case is not the less worthy of attention.

I never for one instant intend to be understood as wishing to see such treatment substituted for that of the lancet in most ordinary occasions where its use is signal and direct, but there are many others where the above may be successfully employed, either by itself, or in conjunction with, or consequent to some mode of depletion.

Edinburgh, 21st October 1837.

ACOUSTIC SURGERY.

The Air Condenser applied as a Remedy in cases of Deafness. By Dr Kramer, Practical Physician in Berlin, and author of a work on the Nature and Treatment of Diseases of the Ear. (Wochenschrift für die gesammte Heilkunde, No. 28. Berlin, July 15, 1837.)—In my work on the Diseases of the Ear, (p. 252, fig. v.) I have described under the name of air-condenser, an apparatus for applying compressed air to cases of diseases of the middle ear, and I have also pointed out its great utility, and even indispensability, in the examination and treatment of most ear complaints. Since then, I have materially improved the construction of this condenser, so that, with the utmost simplicity of construction, it is now become extremely convenient to manage, and powerful in its operation. This improved construction I have employed for the last twelve months; several new instruments have been made after the pattern, and two accurate engravings have been sent to London to Drs Bennett and Wharton Jones, so that I think it right to communicate to the public, in quarters where any interest is felt in such a subject, a description of this my newest air condenser.

It is fastened (Plate IV.) with strong metal screws, to a strong round oaken stool, *q q q q*, 1 foot ten inches high, and without a back; and consists of the following pieces:

The chest or case *a*, *b*, *c*, *d*, *e*, is of cast brass, 10 inches high, and 5 in diameter; and internally of 9½ inches high, and 4¼ in diameter; it is furnished at *p* with an educt and cock, to which an elastic air-tight tube 1 foot 7 inches in length is attached.

The pump tube, *f*, *g*, *h*, *i*, likewise of cast brass, 10¼ inches high, and 2½ in diameter, is screwed air-tight into the case, so that the whole stands 13 inches high above the stool.

At *l* is a small hole to admit the air into the pump tube, and at *s* in the piston box is a valve, which, as the piston is raised, allows the air to pass into the lower chamber. At *k* is a valve for the passage of the air into the interior of the case.

The piston rod *m*, with its stuffing box, is moved up and down with no great effort by the pump handle *n*, *o*, of 1 foot 10 inches in length.

The whole, besides possessing great solidity, is extremely handsome, of very moderate weight, and by the proper relation of the cubic contents of the pump tube to those of the case, (about as 1 : 2) causes a considerable compression of the air in the machine by a few strokes of the piston. The degree of greater or less violence in the rushing out of the air is brought completely under the control of the operator, by suitably opening the cock *p*. I have never hitherto found it necessary to apply a greater compression of the air than is obtained in this condenser by twenty-four strokes of the piston.

The application of compressed air is made upon principles which are more minutely described in my " Diseases of the Ear," Part ii. ch. 2 and 3, to which, therefore, I refer for further information. Here it will suffice, to communicate a few cases, in which deafness, arising from mucous obstruction in the cavity of the tympanum, has been completely removed by the application of the air condenser.

Case I.—Franlein Lieder, of this city, of delicate, slightly scrofulous constitution, complained for at least three years past of considerable hardness of hearing, with noises in the ear, for which, bleeding, strong saline purging, blisters, and cold washing of the ear, had been hitherto applied without success.

When she put herself under my care on the 27th of January of this year, she could hear my watch at three inches distance with her left ear, and at 10 inches with her right one. The internal noise was, in both her ears, dull, continuous, and accompanied with great heaviness in the head; both were sensibly greater in damp cold weather. The patient could not say anything with certainty about the cause of her deafness.

Upon examining the ears, I found in both the external ducts a quantity of dark ear-wax, which was immediately removed by syringing with warm water. By this, the heaviness of head, the sound in the ear, and the dulness of hearing, were at once much relieved; she could now hear my watch with her left ear 15 inches off, and with her right one about 4 feet. Notwithstanding this important improvement, her hearing was not yet in a normal or healthy state.

The next day, I inserted the catheter into the mouth of the Eustachian tube; upon blowing in, I heard a loud rumbling (brodelndes) sound in the cavity of the tympanum, and was hence led at once to suspect a mucous obstruction of that cavity. The application of the air-condenser placed this conjecture beyond a doubt, although a slight pain in the ear, and a deterioration of the hearing down to two feet was for a short time the consequence. On the 29th she heard my watch at 28 inches with her left ear, and at 7 feet with her right one. The sound in the ear was scarcely perceived any more with this ear. After repeated moderate applications of the condenser, the distance of hearing reached, on the 3d February, to 14 feet on the left side, and 30 on the right, without any sound whatever in this ear. I now, therefore, introduced the compressed air only into the left ear, and so completely did it cleanse this ear also, that on the 9th February,—fourteen days, therefore, from the beginning of the case, it also could hear my watch at 30 feet off, with a slight remainder of noise in the ear, kept up by the baleful practice of cold-washing the ear.

This patient had taken no medicines whatever, and had only been put upon a dry diet. The accuracy of this communication will be confirmed by Privy-Councillor Dr Steinrück, as physician to the Lieder family.

Case II.—Wilhelm Reschke, aged 17, (employed in Petri's circulating library,) slenderly formed, thin, and of a pale complexion, complained since he was four years old of noise in the ear, difficulty of hearing, much phlegm in his mouth, sore throats, swollen glands and uvula, and stoppings in the nose. For these complaints, which still subsisted, he put himself under my care on the 17th September 1836. He could then hear my watch at 2 feet with his left ear, and at 15 inches with his right one.

On examining the organ, I found the external passages healthy. The air, when blown through the catheter into the Eustachian tube, did not immediately, on the left side, penetrate as far as the drum, but did so very distinctly on the right side, with an instantaneous extension of the distance at which my watch was heard to 4 feet, and with the sensation of great freeness and lightness in the whole head. By this result, the existence of an obstruction in the cavity of the tympanum was established.

In the second sitting the air reached the drum on the left side likewise, and was accompanied with a feeling as if it were working itself through a dense mass, a feeling which did not disappear until after several repetitions of the air douche. It then gave way to a greater lightness in the ear. The hearing distance was improved to 4 feet.

Seven other sittings before the air condenser followed this one, the last was on the 1st October, in which, the air struck quite freely and clearly upon the membrane of the tympanum; the sound had altogether ceased, and both ears continued to hear my watch at a distance of 30 feet.

The cure was now complete, and has since remained without deterioration. The patient had taken no medicines; I had only forbidden him mucilaginous nourishment and beverage.

Case III.—Carl Donath, 9 years old, of tender, weak constitution, delicate nose, small lively eyes, and great general vivacity, suffered from his earliest youth from hardness of hearing, proneness to coughs and colds, much phlegm in the throat, without any swelling of the glands. Noises in the ear had been frequent until the last three months, but since then none at all, without any change in the rest of his condition.

When he requested my assistance in October 1836, he could hear my watch at 5 inches with the left ear, and at 4 with the right one. I found the *membrana tympani* on both sides slightly thickened. Delicate veins ran along the *manubrium mallei*. When the catheter was introduced into the opening of the Eustachian tube, the air which was blown in, penetrated, with a loud rumbling (Brodeln) to the drum, and the hearing was instantly extended to a distance of 2 feet for the left ear, and 3 for the right one; by which the existence of mucous obstruction in the middle ear was put beyond a doubt.

So in the second sitting also, I only blew into the cavity of the tympanum, and this was sufficient to extend the hearing distance on the left side to 5 feet, and on the right to 5½.

In the third sitting I had recourse to the condenser; after which, the distance reached to 8 feet on the left side, and 6 on the right. In the fourth sitting it was 15 feet on each side, and in this manner the hearing continued to improve after each individual sitting. At last, on 22d November, (in the eighth sitting,) the air streamed altogether clear, and without any rumble, against the membrane of the drum; after which my watch was audible to each ear at a distance of 30 feet. This healthy state has been constantly preserved ever since, notwithstanding many colds. It was simply the result of the excellent working of the air condenser, which was aided only by a thin strong diet, without any assistance of medicines.

Case IV.—Carl, son of Burgesmeister Herr Rehfeldt, of this place, 10 years old, of lymphatic constitution, inclined to coughs and colds, but in other respects healthy, had suffered for some years intermittedly more or less, of a hardness of hearing, and was put under my care in the spring of 1836. He then heard my watch 14 inches off with his left, and at 4 inches with his right ear, and complained of a violent hissing in both ears.

I found both the external passages of the ears perfectly clean, and the membrane of the *tympanum* transparent. When I blew through the catheter into the cavity of the tympanum, I heard distinctly a loud rumbling. The hearing improved itself at once to 20 inches left, and 18 inches right side, so that an obstruction of the middle ear could be distinctly recognized. It was of less moment that the entire hollow of the opening was covered with clammy slime, and the *velum* of the palate was found to be slightly red, and very relaxed.

I first put the patient upon a diet of dry, thin, strong food, and gave him a mild aperient. On the 1st of June I began the direct treatment of the ear with the air condenser, at first with great caution. In the second sitting on the 4th of June, the stream penetrated with a loud rumbling, and at last with a sharp explosion, against the membrane of each ear; whereupon the hearing distance increased to 3 feet left, and 2 feet right, and the sound in the ear suddenly ceased entirely.

It would be tedious to bring before the reader the course of the treatment through each single sitting. It may be sufficient to state, that in the first week of the cure, the mucous accretion of the cavity of the drum constantly reappeared soon after the sittings, with a corresponding diminution of the hearing distance; that this was again extended by each douche, the air always rushing in with a strong rumbling, and always bearing out on its return through the nose a great quantity of slime, until after forty-eight sittings, (the last of which was on the 26th September,) the mucous congestion was altogether removed, so that the air streamed freely and clearly upon the drum, and my watch was heard by each ear at a distance of 30 feet. This excellent state of hearing has maintained itself without variation until now, through all the changes of the winter; only out of caution I still apply the douche to both ears once in four weeks, and forbid all slimy, unctuous, and such sorts of food and beverage.

The Counsellor Dr Grâfe, House Physician to the Rehfeldt family, can vouch for the accuracy of this communication.

MEDICAL ECONOMY.

Proposition by the Dublin College of Surgeons to regulate the practice of Apothecaries, Druggists, and Dispensers.—We have received from a Dublin correspondent the following letter, on a proposed application by the College of Surgeons in that city, to the Legislature, relative to an alteration in the laws regulating the practice of pharmacy in Ireland. As various misconceptions have gone abroad regarding the nature and objects of the regulation proposed by the Royal College, the author of the subjoined letter undertakes to explain them as fully and clearly as at the present stage of the business may be practicable. As we regard it necessary, in justice and fairness, to allow all parties to have full opportunities of stating their views on important points in medical legislation and economy, we willingly give publicity to this letter; and as it is of the first moment, that no undue prejudices be created regarding any measure proposed to be introduced, we think it proper further to add, that the Royal College of Surgeons appear to be taking a most proper and necessary step in this matter,—proper in reference to their own rank, dignity, and influence on the profession in Ireland, and necessary not only to their own usefulness as a public body, but to the welfare of the public at large. Such an example, we think, cannot be held up in a light too clear and impressive; and we trust, that as these measures, it is to be hoped, will be founded in wisdom, they shall be attended with success. The Royal College of Surgeons in Dublin is perhaps the most enlightened professional incorporation in Europe, and requires from its members a greater range of accurate knowledge than any other body, excepting the Medical Faculty of the University of Edinburgh. The accomplishments required by such a board, and the fact that they are required, are a sufficient proof, that whatever they propose will be for the dignity and honour of the medical profession, and for the good of the public at large.

The question here to be determined, and made the principle and basis of any legislative enactment, is not what is to be for the benefit and advantage of the apothecaries and druggists, but what is to be beneficial to the public, and in what manner can *bona fide* medical and surgical practitioners be provided with medicinal agents, upon the physiological and therapeutic effects of which they can rely, in the treatment of the patients committed to their care. Experience has hitherto shown that the interest of the apothecary and druggist on the one hand, and that of patients and the public on the other, are by no means the same, and do not in the course of treatment for disease advance on the same line. Experience has shown that while it may be for the benefit of the patient, under the direction of his medical or surgical adviser, to swallow but a small proportion of medicinal substances, and that only at certain intervals, it is the interest of the apothecary and druggist that they should at least prepare, and send in as much as their laboratory men may have leisure to compound, whether the patient takes the compositions thus made, or lets them alone.

It is from these circumstances quite clear, that the apothecaries properly so called cannot be fit judges on a question of this description, and that every opinion which they give, must be liable to revision by a superior and less interested tribunal. Every impartial judge, on the other hand, must admit, that physicians and surgeons, properly so named, who have no interest in prescribing medicines in greater quantity, or at more frequent intervals, than they conceive requisite for the removal of the symptoms, and the cure of the diseases which they are required to undertake, must be much better judges in this case of what is for the true interest of their patients in particular, and the public in general. The strict physician and surgeon, that is to say, he of either art who does not defile his hands, corrupt his feelings, or confound his intellect by the admixture and composition of all sorts of medicinal compounds, not unfrequently neither scientific nor useful, can have no interest in this matter, and must form consequently a much more competent witness than one who has. This point is indeed so clear, that we must acknowledge our inability to perceive upon what principle of justice or propriety the opposite doctrine can be maintained. Judging from experience not the most limited of what can be done, and what cannot be done by a person even of very active habits in the medical profession, we do not perceive how it is possible for one whose mind is engrossed with the routine details of pharmacy, to be always capable of forming an opinion on the nature or extent of disease, or managing its treatment,—nor conversely, for one who is much occupied in observing the diversified forms and progressive changes of diseases, in conducting their treatment, and in watching favourable opportunities for the adoption of remedial measures, whether dietetic or medicinal,—to attend to the details of the mixture and composition of many medicinal compounds, even for the patients under his own care. If it be said, this may be effected under the superintendence of the principal by active and intelligent assistants, the concession, for which we contend, is made; and it must be admitted to be proved, that the same head and hands cannot attend to diagnosis, prognosis, and treatment, and the multiplied details of pharmacology. Let it be admitted at once, that the difficulty and the responsibility of distinguishing and applying the appropriate treatment of diseases, whether medical or surgical, common sense, and the principle of the division of labour, whether mental or corporeal, at once require that the functions now mentioned be performed by one order of professional persons, and the practical details of pharmacy be performed by another. Let the apothecaries, for whose real and lasting interest we have a genuine regard, at once admit that the latter branch of art might be divorced from the former, with which it has

too long been conjoined by a forced and unnatural union, equally pernicious to both. If the apothecaries will be medical and surgical practitioners, then let them abandon to a separate order the laborious but mechanical details of preparing and compounding medicines; and we shall be the first to admit their just claims as useful members of a profession not less honourable than useful. Any other course cannot fail to be injurious to both orders; and while it will assuredly make both ignorant, incompetent, and very probably dangerous medical and surgical practitioners, it will conversely keep the race of apothecaries and druggists in a state of ignorance of the extent and resources of their own department, and make them a body of confused, precipitate, and mechanical dispensers of medicine. From some experience in this matter, we must be permitted to say, that an accurate knowledge of materia medica and pharmacy, with a sufficient knowledge of the botanical, zoological, and chemical principles required, is perfectly sufficient to occupy at least, in their practical application, the time and attention of any single individual; and unless the apothecary and druggist possess at least a competent share of these species of knowledge, he must be quite unfit to exercise the functions which he undertakes, either with comfort and credit to himself, or advantage to those to whom he dispenses medicines. Even the knowledge of adulterated drugs, so important to the apothecary and druggist, is a most important and difficult branch; and how much it is neglected by those who call themselves by these once respected names, it is not necessary here to say. These would be the true means by which the apothecary and druggist might raise themselves to deserved eminence. These are the means by which they might assuredly render their names respected and celebrated, and by which their celebrity might be fixed on the solid foundation of the extensive and accurate knowledge of a branch of medical art, without the aid of which, the other divisions must be imperfect and inefficient, and which is second only to the more important and difficult art of recognizing the presence, extent, and nature of disease, and the circumstances which render remedies admissible or not admissible.

"Sir,—A notice which has appeared in the papers announcing the intention of the College of Surgeons to apply to Parliament for an alteration in the laws for regulating the practice of pharmacy in Ireland, has led to the publication of advertisements by certain apothecaries in this city, so intemperate and offensive that the public may be led to suppose that some very unjustifiable attack is about to be made on them. To remove any such impression, and to explain the real objects contemplated, I venture to trespass on your columns, as it is obvious that the college cannot condescend to reply to statements conveyed in such language.

"In the year 1791, an act was passed for regulating the profession of an apothecary in Ireland, in consequence, as it declares, of the great inconveniences which have arisen 'from the want of a hall amply supplied with medicines of the purest quality, prepared under the inspection of persons well skilled in the art and mystery of such preparations, and also, because frequent frauds and abuses have been imposed and practised on many of his Majesty's subjects within the city of Dublin and the liberties thereof, and other parts of the kingdom of Ireland, by the ignorance and unskilfulness of divers persons pretending to the art and mystery of an apothecary, to the injury of the fair trader, the disappointment of the physician, and the imminent hazard of the lives of his Majesty's faithful subjects.' This act incorporates 'one company or fraternity of judicious apothecaries well skilled in preparing and compounding medicine,' and provides, that 'no person shall open shop, or act in the art or mystery of an apothecary until he shall have been examined as to his qualification and knowledge of the business.' Here then is a corporation established to erect a hall amply supplied with medicines of the purest quality, and prepared under the inspection of skilful persons; to prevent frauds and abuses in the sale of drugs; and to examine persons and grant certificates to them to open shops, and act in the art and mystery of apothecaries; but instead of carrying into effect the intentions of the legislature, these persons, so incorporated, have usurped the duties of physicians and surgeons, left the care of their shops to apprentices and journeymen, and converted the Apothecaries Hall, originally established for the sale of pure medicine, into a kind of counterfeit college for lecturing and granting mock diplomas in medicine and surgery. Is not all this tantamount to a dissolution of this corporation, as far as relates to its original intention? Does any one now, doubtful of the purity of a medicine, go seek for it at the Apothecaries' Hall in preference to any other druggist's shop? Are frauds and abuses in the sale of drugs prevented—or do the certificates granted of fitness to open shop, under the high-sounding titles of diplomas, secure to the public a man qualified in a superior manner to act in the 'art and mystery of an apothecary?' I leave the public to answer these questions, and proceed to ask another.—Is it unreasonable for the members and licentiates of the College of Surgeons to seek a remedy for this state of things? Does not the safety of those who employ them imperatively demand that they shall insist upon a prompt and efficient remedy? They have, therefore, determined that there shall not, in future, be any doubt as to the purity of the medicines they employ, the correctness with which they are prepared, and the fidelity with which they are administered. This they propose to accomplish by obtaining an act of Parliament repealing such parts of the charter of the college, and the Apothecaries' Act, and making such provisions in place of them, as will secure to them the right, either of compounding, or mixing and administering with their own hands the medicines they wish to give to their patients, or if they think it preferable to cause the medicine they prescribe to be compounded by real apothecaries, compelled by law to superintend the business of their shops or laboratories, and not engaged in the arduous duties of medical practice, or distracted by ridiculous efforts to practise surgery. They are resolved, that there shall not in future be any doubt as so the purity of the medicines they employ, the correctness with which they are compounded, or the fidelity with which they are administered, and that the monstrous anomaly of one practitioner administering medicine to the patient of another, whom he probably beards as a professional equal, or resists as a rival, shall no longer be tolerated.

"The College of Surgeons has been entrusted by the crown and the legislature, with the duty of 'enforcing a due system of surgical education in Ireland,' and that duty they are determined still to perform, and to resist by every means in their power any attempt to interfere with their rights, or any surreptitious contrivance to worm into the country a race of ignorant pretenders, thinking not how they are to cure diseases, but how they are to make money of the diseased. I am, Sir, your obedient servant."

Died on Tuesday the 7th inst. Dr James Forbes, Inspector-General of Army-Hospitals. Dr Forbes returned last year from Ceylon, where he had served with great credit as Deputy Inspector-General of Hospitals, and was promoted to the important appointment of Inspector-General of the Hospitals of the King's Troops in the peninsula of India. Dr Forbes, who was in his fifty-ninth year, was a distinguished medical officer of the army, and enjoyed in a singular degree the esteem and regard of all officers, civil and military, and his death is generally regretted throughout the army.

The remains of Dr Forbes were interred in Rochester Cathedral, near the spot where a monument is now erecting to the late Sir William Franklin. The funeral procession to the Cathedral was attended not only by all the medical officers in Chatham, those of the Navy, Marines and Ordnance, with the Director-General of the Army Medical Department, but all the field-officers and many other medical officers in garrison.

EDINBURGH: PRINTED BY JOHN STARK, OLD ASSEMBLY CLOSE.

	sher	f.		woman	a year	
	Plank	f.	49		Winter cough for 6 years	Usu. tion.
	Taylor	f.	32		6 months	Usual, acute pain of le dyspnœa before de
412	Rutherford	m.	36	Hewing mason	4 months	Pain in left side, h moptysis, œdema,
417	Farquhar	f.	24	Servant	8 months	Vomiting of blood, ingesta, pain of sid
418	Smith	m.	37	Brewer	Several times in the hospital	Usual
419	M'Intyre	m.	37	Hewing-mason	8 months	Usual
421	Lascelles	m.	58	Porter	14 days	Those of pneumonia
439	Turnbull	f.	29		Cough from 3 years old	Asthma for some yea palpitations, drops
451	Hunter	f.	14		In bad health for 15 months	Almost no cough, slig hæmoptysis
462	Johnston	m.	40	Brass-founder	6 weeks	Usual, diarrhœa oc sionally bloody
464	Harris	m.	38	Hawker	16 days, at first rigors	P. 120, resp. 28, cough, much dyspn
484	Alexander	f.	40		Cough for more than a year	Usual, pain of throat
494	Falconer	f.	21		1 year after cold	Hæmopt. at first, usu
516	M'Daid	f.	40	Hawker	6 weeks	Occas. hæmopt. aphon others usual
517	Kay	m.	36	Bookseller	9 months from cold	Hæmopt., others usu
519	Anderson	m.	46	Bookbinder	3 years, from cold	Hæmoptysis, dropsy
529	Charles	f.	27		3 weeks	P. 120, resp. 72, gr dyspnœa
538	Finlay	m.	52	Slater	3 months	Pain of throat
547	Wright	m.			4 months	Acute
552	Redpath	m.	25	Pedlar	Short time	The usual
556	Davy	m.	17	Sailor	4 months	The usual
560	Ford	f.	27		4 months	Usual, at last those dysentery
566	Leitch	f.	28		Some years	Asthma, usual

NS OF THE ABDOMINAL ORGANS.

L INTESTINES.	LARGE INTESTINES.	MESENTERIC GLANDS.	OTHER ORGANS.
Nothing morbid found.			
s at lower part tu- ular	Small inflamed ulcers in commencement	Enlarged	Partial thickening of capsule of spleen
ged glands at the er part	Extensive ulceration. A perforation in cœcum		
in the lower t	Ulcers in the beginning		
l ulcers in lower t	do		
ian glands enlarged e ulcerated			
s in the lower t	Ulcers in commencement		
ulcers in lower t			
Nothing morbid found.			
	Annular ulcer in cœcum		
Nothing morbid found.			
ls of lower part en- ged and ulcerated		Enlarged and tubercular	A piece of bone of size and shape of patella imbedded in the spleen
Other organs sound.			
All the organs healthy.			
ulcs. in lower part in glands of Peyer	Extensive ulcerations in the beginning	Enlarged and tubercular	
deep ulc. corresp. hes in peritonæum	Extensive ulcers, one destroyed ileo-cœcal valve	Much enlarg.	
	1 or 2 ulcers in cœcum		
			2 stones in gall-bladder
ian glands enlarged			
ed and tu-	2 ulcers in caput cœcum		Pus & lymph in rt. iliac fossa & pelvis
com-	One large ulcer in cœcum		A white hard lar-

THE

EDINBURGH

MEDICAL AND SURGICAL JOURNAL,

1. APRIL 1838.

PART I.

ORIGINAL COMMUNICATIONS.

Art. I.—*Report of the Royal College of Physicians of Edinburgh on the Adulteration of Drugs.*

Edinburgh, 2d March 1838.

At an Extraordinary Meeting of the Royal College of Physicians held this day, to consider a Report from a Committee of its Fellows respecting the Adulteration of Drugs, the following Resolutions were agreed to:

1. That the College approve of this Report, and adopt it, and direct it to be published in terms of the recommendation of the Committee.

2. That the thanks of the College be given to Dr Christison, Secretary to the Committee, for the very great trouble he has taken in collecting the information on which the Report is founded.

(Signed) in name of the College,
W. P. Alison, *President.*

Report *of the Pharmacopœia Committee of the Royal College of Physicians on the Adulteration of Drugs, 24th January* 1838. At a meeting of the Committee held this day for considering finally a remit from the College to inquire and report respecting the extent of the adulteration of drugs and the means of abating the practice,—Present *Dr Alison*, President, and *Drs Davidson, Abercrombie, Graham, Poole, Traill, Ransford,* and *Christison,*—it was resolved after careful deliberation to report as follows:

1. That the adulteration of drugs is undoubtedly carried on at

present to a great extent, and affects more or less a great proportion of the most important articles of the Materia Medica.

2. That, while these adulterations may be presumed to be practised in a variety of quarters,—by the foreign producer, foreign merchant, wholesale druggist, chemical manufacturer, and retailer,—some of the more obvious or discoverable sources of the evil are the inadequate education of retail druggists, especially in practical chemistry,—the want of an authorized system of simple tests for ascertaining the purity of drugs,—the want of any check for preventing adulterations,—and the necessity, real or supposed, for lowering the prices, and of consequence the quality of drugs, in order to meet the unreasonable demands of the public.

3. That the practice of adulterating drugs will be probably diminished by the College of Physicians adding to the Pharmacopœia, as it has resolved on doing, a list of simple characters for the articles of the Materia Medica, by means of which they may be ascertained to be of the requisite degree of purity for medicinal use, and free from certain known adulterations.

4. That, while this system may prove very efficacious by furnishing retail druggists with the means of detecting adulterations practised elsewhere, and thus of securing their own true interests, it is highly desirable that the education of persons intended for this profession should be elevated as well as regulated and ascertained by some competent authority; and that in this way important benefits would be conferred on the profession itself, on medical practice, and on the public generally.

5. That the adulteration of drugs, provided the two previous measures were enforced, might be in a great degree put an end to by a methodical system of visitation of public shops; which, notwithstanding some failures in this country, your Committee are inclined to think may be rendered efficient under certain conditions, and more especially if conducted mainly by an organized and well-educated body of druggists themselves.

6. That advantage would also be derived from stated authoritative advertisements of the wholesale prices of genuine drugs, and authoritative announcements of newly discovered adulterations.

7. That, although your Committee do not think it their duty at present to suggest any specific means for carrying the above-mentioned measures into effect, they would strongly recommend that the state of the case be made generally known by the authority of the College, and for this end that the College shall publish this Report, together with an Appendix consisting of detailed observations on the subject, which have been communicated to your Committee by their Secretary, and are lodged herewith.

8. That the proceedings of the College be communicated to the Royal College of Surgeons, with the view of ascertaining whether,

and in what way, the two bodies may co-operate in carrying into effect any resolutions that on careful inquiry may seem to them advisable.

In name of the Committee,

R. C. *Sec.*

APPENDIX.

OBSERVATIONS ON THE ADULTERATION OF DRUGS.

By DR CHRISTISON.

IT is well known to every one practically conversant with pharmacy, that the adulteration of drugs is at present practised in Britain to a most injurious extent, and a general feeling prevails that it has been for some years past upon the increase. Whether this impression be correct or not, there can be no doubt of the extreme frequency of the practice. It may be safely averred as the result of the best inquiries on the subject, that few medicines in general use escape occasional sophistication; that some are scarcely ever pure; that the impurities are frequently so great, as to render the articles nearly or entirely inefficacious; and that medicines of this kind are to be found occasionally in the shops even of the most respectable druggists, and notwithstanding great pains on their part to obtain and dispense nothing but what is genuine.

For some years past the attention of the College of Physicians of Edinburgh, in some measure the guardians of the public in this matter, has been pointedly turned to an evil so serious, and so disgraceful to the present improved state of pharmacy. The College of Surgeons of this city have also been led more recently to inquire into the subject; and have appointed a committee to examine into the extent of the practice, and the means of abating it. A short time ago the former College was requested to co-operate with its sister institution, and the two bodies have resolved to join in the investigation. It cannot be doubted that they will proceed cordially in the task they have thus laid down for themselves; and it may be confidently anticipated that their labours will not terminate without some important practical results. It is to accelerate their operations, by making the existing state of the question generally known, so far as my inquiries have hitherto gone, that the following observations have been drawn up.

I believe I shall be most likely to attain the object in view, by treating the subject under the three subsequent heads. It will be right, in the first place, to show from actual examples, that the adulteration of drugs is practised to an extent injurious to the success of medical practice, and in a way which defies the caution even of well informed and conscientious druggists. An attempt will next be made to point out the sources of these adulterations, that is, the quarters where the practice is carried on, together with the circumstances in the commercial history of drugs which seem to have led to it. And lastly,—a sketch will be given,—but with due diffidence on a subject of such intricacy, and surrounded by so many difficulties,—of those measures which appear practicable, and most likely to diminish the evil.

I. Under the first of these heads, it might perhaps be sufficient to refer to the general conviction of the profession, or to what has been written on the adulteration of medicines in various excellent works on Materia Medica and Pharmacy. But it will bring the matter more home to the minds of all, if some details be entered into, consisting of a few facts which have chiefly occurred to my own observation, and among which are some, not unimportant, yet either unknown, or but little attended to in any pharmaceutic works. With this view is subjoined the following list of adulterations, which could be easily extended, were it necessary.

1. A few years ago I directed the attention of medical men to the frequency of the adulteration of *Iodide of Potassium* with Carbonate of Potash. A faint contamination of this nature is exceedingly common, because it can with difficulty be avoided in the manufacture of the salt; but impurity from this cause is of little consequence to medical practice, because it never exceeds one, two, or at the utmost five per cent. Not unfrequently, however, it amounts to ten per cent or upwards, for which carelessness is the lightest excuse that can be found; and I have examined specimens, at one time very generally to be met with in this country, where the carbonate with its accompanying water amounted to ninety parts in the hundred,—which, it need scarcely be said, was an express sophistication. Can we wonder then, that practitioners should complain of the iodide of potassium, that they have given it for months, nay even for years, without observing any effect either on the constitution, or on the disease for which it was administered? Another adulteration is with muriate of soda or potash. Some have considered this to be a frequent impurity. But I have not met with it so often as the other, and it has appeared to me always less in amount, seldom surpassing ten per cent. It is an intentional adulteration; at least there is no circumstance in the processes for preparing iodide of potassium which can lead to its accidental introduction, except in small quantity.

2. *Iodine* itself is another instance. Various impregnations of Iodine have been indicated by authors, such as with oxide of manganese, brick dust, and other substances of a fixed nature; which however I have never met with throughout a long train of investigations. But there is another impurity, at present seldom wanting in British iodine, and which has not yet been publicly noticed. This is with water. It is probably not very easy to prevent a certain impregnation with water. But nothing except gross carelessness or fraud will account for the presence of fifteen per cent which I have separated, or for twenty per cent, which I am informed by M. Robiquet of Paris is not unfrequently found in the British iodine imported into France. Perhaps this amount of impurity is not of very material consequence to medical practice, the variation of the dose by a fifth part being probably not so important as many would have us think. The admixture however is not the less a fraud,—a fraud, I may add, which, according to M. Robiquet, has of late greatly reduced the demand in France for iodine of British manufacture.

3. Another good example is the spirit of *Nitric Ether*, a medicine of much value, and in most extensive use. I have not myself made any experiments upon its adulterations. But the subject may be equally well illustrated from the evidence delivered in 1834, by Mr Cooper, Lecturer on Chemistry in London, before the Medical Education Committee of the House of Commons. Mr Cooper, while travelling between Bath and London, happened to call for an acquaintance, a chemist and druggist in one of the intermediate towns. During his visit, the travelling member of a wholesale house in London called in pursuit of his occupation, and among other things offered for sale the spirit of nitric ether. His customer asked him its price, to which he replied that he had it of three prices; 2s., 3s. 6d., and 4s. 6d. a pound. The retailer ordered the article of the second quality. This drug is subject to a certain variety, because it is not a regular and definite compound, but a mere mixture of rectified spirit and nitric ether. Certain differences must exist, according as it is prepared by the process of the Edinburgh, the London, or the Dublin Pharmacopœias. But it need scarcely be said that no such differences will account for so extravagant a variety of price, as that mentioned by Mr Cooper, and that the two inferior qualities of the drug must have been adulterated, probably with rectified spirit, or the cheaper addition of water.

4. A most important set of adulterations are those practised upon substances of very great energy, and which are given in minute doses. For here it is not merely a fraud that the public must submit to; life itself may in consequence be brought into danger.

Of this, *Hydrocyanic Acid* is an excellent example. The profession are generally aware of the extreme uncertainty of the strength of this formidable medicine. The fact has been often brought experimentally under my notice; but I prefer at present to quote some recent observations made by Dr Fyfe, and presented by him in a Report to the Committee on Adulterations appointed by the College of Surgeons. Few medicines perhaps are subject to so many sources of variation as hydrocyanic acid. It is prepared by different processes, which are calculated to yield it of various strengths. Variations arise even where the same process is followed, according as the rapidity of the distillation varies, or the temperature of the refrigerator. It loses some of its acid unless carefully preserved. And a further diminution invariably occurs in the shop of the druggist, as the contents of a bottle are gradually dispensed. For one or another or all of these reasons the proportion of real acid differs exceedingly. Among samples obtained in shops of great respectability, Dr Fyfe found some that contained four times as much as others. Serious accidents might in consequence ensue in medical practice. This medicine is variable in its effects in different constitutions; and, therefore, the physician must always begin with a very small dose, and gradually increase it till the effect he desires be obtained. Now, suppose he has begun with the weakest acid of the shops, that he has brought up the dose, as may well happen, to ten, fifteen, or even twenty drops, and that then, the store of this sample being exhausted, the druggist betakes himself to an article, which, unknown to him, is of four times the strength. What is likely to be the result? The death of the patient would be not improbable.

5. Let me add another instance of the like kind. The active principle of nux-vomica, *Strychnia*, now currently employed as a remedy in the chronic forms and stage of paralytic affections, is very little inferior in energy as a poison to hydrocyanic acid. In the shops it is scarcely ever met with pure; because even the impure article bears a very high price, and because its complete purification, besides being troublesome, and probably unnecessary in respect of its excessive energy, cannot be accomplished except at such loss as would raise its value from fifty shillings to five or six guineas an ounce. The article of the shops always contains a large proportion of another alkaloid, brucia, whose effects on the animal body are precisely the same in kind, but much inferior in degree. This impregnation is probably advantageous rather than the reverse; because by diluting a drug of such tremendous activity as strychnia, it is rendered more manageable in medical practice. But another impurity, of great consequence in a medicinal point of view, is inert colouring matter. The proportion of this

varies much, some specimens having a dark-brown colour, others a light grayish-brown, and some being very nearly colourless. It is almost unnecessary to point out the serious consequences which may ensue from such irregularities in the strength of so potent a medicine. The danger is the greater, that, in order to do any good in palsy, it must be given in such quantity as to excite a certain degree of its physiological or poisonous influence. An accident which happened not long ago in my own practice will sufficiently illustrate what is here stated. A man affected with palsy took every evening gradually increasing doses of a strychnia less pure than the average, till at length one evening the dose was directed to be increased from two-thirds to three-fourths of a grain in two pills. At the same time the sample of the medicine supplied by the apothecary was changed for one almost of snowy whiteness, and consequently far purer. Through some lucky whim the patient took only one pill. In the night time he was attacked with violent tetanic convulsions, protracted spasms of the extremities, severe locked-jaw, violent opisthotonos, spasmodic fixing of the chest, and all the other formidable symptoms of poisoning with this alkaloid; in which state he continued for several hours. From all we know of the effects of strychnia, there can be little doubt that had he taken both pills the issue would have been fatal.

6. Apt illustrations may also be taken from vegetable drugs of a compound nature, into which impurities may be introduced accidentally, or by design, more easily perhaps than into any other description of medicines, and where also the detection of them is sometimes exceedingly difficult. Under this head I shall take as examples three of the most familiar and most valuable articles of the Materia Medica, namely, Gamboge, Scammony, and Opium. *Gamboge* is one of those purgatives, to which some physicians entertain a dislike on account of its supposed irregularity and violence of action. But this notion has always appeared to me founded on prejudice; for after extensive trial of it, often without any adjunct except inert powders to facilitate fine division, it has appeared to me equally manageable, safe, and uniform in effect, with any other active cathartic. Various causes may be assigned for its occasional irregularity of action. Whether its sophistication is one cause I know not; but the frequency and extent of the adulterations of gamboge are sufficient to account for the variations complained of. I have been led to pay particular attention to this subject,—which, by the way, is not noticed in any work on pharmacy I have seen,—in consequence of having lately made a detailed inquiry into the sources and composition of the different kinds of gamboge, which has been published in the Companion to the Botanical Magazine. Three kinds of the

drug are known in the English market, which all come from Siam by way of Singapore, namely, Pipe, Lump, and Coarse Gamboge. The first is perfectly pure, consisting of resin, gum, and a little moisture; and the resin, its active part, amounts on an average to 73 per cent. The two others, which a person of skill can easily distinguish in mass, but not so easily in powder, are invariably adulterated. The impurity is probably some compound amylaceous matter, for there is both fecula and lignin; and, for reasons I need not stop to explain, it must be introduced intentionally. The amount in lump gamboge is about 11 per cent, probably too little to affect appreciably its medicinal activity. But in the coarse gamboge,—which some class with the lump variety, and with reason, since its composition is the same in kind,—the proportion of impurity is much greater. I have found in one specimen 23 per cent of fecula, lignin, and moisture together; and in another so much as 51.5 per cent. In the latter the active resin amounted to no more than 35 per cent, or less than one-half the due proportion. It cannot be doubted that any one, who should take the same dose of such a sample one day, and of the pure variety the next, would find very good cause to complain of the precarious action of gamboge.

7. Few articles of the Materia Medica present a history more full of interest than *Scammony.* Known and described by Dioscorides about two thousand years ago, it has been handed down from century to century, through an almost unbroken series of physicians and authors, even to the present time. The descriptions of those who speak from actual observation correspond on the whole closely with the characters of the modern drug; but, which is of more consequence to us, all complain of its frequent adulteration; and, singularly enough, the very kind of adulteration practised seems to have undergone little change. In some parts of the Continent it has no great reputation, and is not much in use. In Britain, however, its consumption is very great; which may be easily inferred from its forming a large part of the compound colocynth mass, one of our most familiar laxative pills. No substance is so seldom to be met with genuine as scammony. The utmost efforts of the druggist to obtain it pure are often unsuccessful for a long period of time; and I have met repeatedly with well-informed members of the trade, who had never seen it in that state, and did not know what it was when it was presented to them. I have made many careful observations on this subject, which will soon be made public. At present a few facts will suffice. Pure scammony, which possesses a pretty clear resinous fracture and lustre, is composed, according to repeated analyses I have executed, of resin, gum, a few grains of sandy

matter, and a little moisture. The gum amounts to 8 per cent, and the resin, its active principle, varies from 77 to 83 per cent, according to the age and consequent dryness of the specimen. Such scammony has for some years cost in the wholesale market about thirty-two shillings a pound; but it is rarely to be met with. The principal part of the scammony in the shops costs only from fourteen to eighteen shillings a pound; which is alone evidence enough that it is a spurious article. Three adulterations have come under my notice,—with chalk, with some amylaceous matter, and with both conjoined. The first variety has very much the appearance of our grey limestones. I may mention the composition of one merely out of a great number I have analyzed. It contained 31.5 per cent of carbonate of lime, more sandy impurities than usual, and only 43.5 per cent of its active principle, the resin. The next variety, which may be called amylaceous scammony, presents a variable proportion of fecula, and along with this a less proportion of a principle corresponding in properties with lignin. Of several specimens of this kind I have examined, there is one which contained 20 per cent of fecula, and about 10 of lignin; and its active resin formed only 37 per cent, being less than one-half of that of the genuine drug. This adulteration is not materially different from that indicated by Dioscorides; who says that the makers of scammony mixed with it the 'οϱοβινον αλευϱον, the flour of a species of pulse, believed on the authority of Sibthorpe to be the *Ervum ervilia*, or bitter vetch. The amylaceous scammony presents commonly an ash-grey colour, and generally a waxy, but at times a somewhat resinous lustre. The last adulteration of importance is with fecula and carbonate of lime together. The appearance of this sort is much the same with that of the last. Frequently where there is a large quantity of chalk, I have found about 4 per cent of fecula, for the presence of which it is not very easy to account; but often also the proportion is much larger. In one specimen I have found 18.5 per cent of carbonate of lime, and about 17 of fecula and lignin; and the resin amounted to 42.5 per cent. Now, all these spurious samples, containing only about half the active ingredient of the pure drug, were considered to be fair average specimens of the scammony of the English market. It need scarcely be added, that the compound colocynth pill made with pure scammony, instead of the common article of the shops, is very different in power from the pill usually met with. It has appeared to me, as we should expect, about twice as strong.

8. Our knowledge of the adulterations of *Opium* is far from being precise. There is no substance used in medicine, into which, on account of the vagueness of its external characters, and the ex-

ceeding complexity of its composition, impurities may be more easily introduced in such manner, as to escape the notice of the practical druggist, and the researches of chemical pharmacy. At the same time it may be doubted whether the impurities indicated by pharmaceutic authors, such as stones, sand, saw-dust, or extract of poppy leaves, are of common occurrence. Most of these substances would be easily detected by the eye and touch of a skilful druggist, and extracts by the change occasioned in the odour. I have no new facts to add under this head. I am ignorant of the nature and extent of the adulterations of opium. But there is also another cause of variation, which is perhaps of at least equal consequence. It is well known that varieties in the plant, differences in climate, and probably too differences in soil and cultivation, are the source of great variations in this drug. The opiums of the Levant, of Egypt, and of Bengal, differ in their external characters and composition to a greater degree than almost any other vegetable remedy; and even that of one region varies remarkably, and in a way that can scarcely be ascribed to express adulteration. Owing to one or other or all of these causes, the opium of the English market, which comes chiefly from the Levant, is exceedingly variable in quality. The only certain method, in my opinion, of determining the quality of opium, is by detaching its morphia, especially in the form of muriate. In the form of muriate the whole active principle may be separated in a state of great purity. Now, the proportion of this salt obtained from good opium, according to my own analysis, and the experience of a very skilful manufacturer in this city, is an ounce and a-half avoirdupois per pound, or about ten per cent; and in one fine specimen of Smyrna Opium, I obtained so much as one ounce and fifteen drachms, or 12 per cent. But according to information communicated to me by the same gentleman, he has sometimes obtained in his operations upon a large scale so little as one ounce per pound, or a trifle more than 6 per cent. Here then is a variation in quality in the ratio of one to two nearly. It is material to add, as exemplifying a statement repeatedly made above, that these opiums were very nearly of the same price, were supplied by a highly respectable wholesale druggist to an experienced manufacturer, and were believed by both to be at least of good average quality;—an excellent proof of the uncertainty of its external characters, by which alone practical men in this country judge of its value. In medical practice we hear constant complaints of the disappointments experienced in using opium and its galenical preparations, owing to the varieties produced in their action by peculiarities of constitution, or by the state of the patient at the time; and it would be the height of folly to deny the influence of these disturbing causes. But we likewise know that varieties equal in degree and the same in kind may be occasioned by varieties in dose. I have sometimes traced to this source unpleasant effects which were at first believed to depend on idiosyncrasy. May it not then be worth while to inquire whether the irregularities, apparently depending on the constitutional or incidental state of the patient, do not originate more frequently than is at present thought in mere differences of dose? —seeing that the drug must be often administered to different individuals, and to the same individuals in different circumstances, in doses of which one may be twice as great as another.

9. To these instances of the adulteration of drugs, in the state in which they are supplied to the retail druggist, it might be well to append parallel examples of the same practice in the case of the galenical preparations of the Materia Medica, which are usually made by the retailer himself. Many adulterations of this nature have come under my notice; but it has not been in my power to examine them with much accuracy, because, on the one hand, the processes for the purpose are often tedious and sometimes unsatisfactory, while on the other hand, some adulterations can scarcely be brought at all under the cognizance of chemical analysis. I shall therefore be satisfied with mentioning one only, which I have carefully examined, out of a list which, with more leisure, would easily furnish many similar illustrations. This is *laudanum;* which, as may be inferred from what has just been said, is liable to vary in consequence of varieties in the crude drug employed in preparing it, but which the following facts will show to vary to a degree which cannot be ascribed to that circumstance alone. Laudanum, which I prepared from first-rate Smyrna Opiums, according to the proportions of the Edinburgh Pharmacopœia, contained 19.1 and 22.1 grains of solid matter, [dried in the vapour-bath till it ceased to lose weight] in a fluid-ounce avoirdupois; and, by a process directed towards the separation of the morphia contained in these laudanums, their value proved to be such as may be represented for the sake of clearness and simplicity by the numbers 120 and 130 respectively. With these facts as the basis for comparison, I have examined laudanum from no fewer than seventeen shops, fourteen of them in this city, and three in one of the chief county towns in Scotland. The results are given in the following table, from which it may be inferred that, according to one method of examination, the difference between the laudanums of the shops in point of strength is in the ratio of three to one, and that by the other, probably more accurate method, the actual difference in value is even greater.

		Solid part of 1 fl. oz.	*Relative morphia.*
1.	Prepared by myself from finest Smyrna Opium	22.1	130
2.	Do. Do. also from fine Sm. Op. somewhat inferior,	19.1	120
3.	Do. Do. from inferior opium,	21.0	90
4.	From one of the best class of shops in Edinburgh,	17.1	130
5.	From another do. do.	10.0	40
6.	From a third, do. do.	20.2	
7.	From a fourth, do. do.	20.8	
8.	From a fifth, do. do.	12.3	
9.	From a sixth, do. do.	18.0	
10.	From a second-rate shop in Edinburgh,	20.8	
11.	From another, do. do.	22.7	80
12.	From a third, do. do.	14.6	
13.	From a fourth, do. do.	20.6	80
14.	From an inferior shop in Edinburgh,	13.4	
15.	From a second, do. do.	13.0	
16.	From a third, do. do.	9.0	35
17.	From a fourth, do. do.	7.2	
18.	From a shop in a county town,	16.8	90
19.	From another of less repute in do.	17.5	100
20.	From a third, do. do.	15.8	90

The deficiency in No. 8 was probably accidental, because the druggist knew to what purpose his laudanum was to be applied,—which, it may be well to add, was not the case in any other instance. In the instance of No. 5, however, accident could scarcely account for the defect; for the laudanum from the same shop was twice found defective at an interval of six months; and besides it evidently contained some extraneous colouring matter. No. 20 also contained a large quantity of adventitious colouring matter, which, when the morphia was removed by ammonia, gave the liquid a dark crimson tint.

II. Having mentioned these examples of adulteration,—which have been purposely chosen from among the drugs most in use, and which it would be easy, if necessary, to multiply to a far greater extent,—I may proceed to the next head of this inquiry, namely, to point out the sources of the practice in question. Under this head, those circumstances will be indicated in the commercial history of drugs which may lead to their adulteration, together with the several quarters where it seems to originate.

Here it will be necessary to apprize those who are not conversant with the commercial history of drugs, that they pass, most of them at least, through a considerable variety of hands before they are finally distributed in the retail trade. Articles of home produce, such as indigenous plants with their preparations, and chemical compounds of domestic manufacture, frequently pass at once into the possession of the retailer; but often too they are obtained by retailers, especially the smaller retailers of towns and villages, through the medium of wholesale druggists, and not directly from the herbalist or chemical manufacturer. Articles again of foreign produce accomplish their passage more indirectly still. The producer disposes of them to the foreign merchant, by whom they are consigned in general to an English drug-broker at some of our great sea-ports, and particularly at London. By the drug-broker they are sold at certain stated sales, usually by sample, and while in bond; and the principal purchasers are the wholesale druggists, or those great retailers who unite a wholesale trade to their other business. By them again the drugs are disposed of to retailers generally throughout the country; but frequently another intermediate step is made in the case of the small retailers in country districts; who purchase, not from the wholesale dealers, but from the larger retailers of the nearest great towns. It must be evident then, that the quarters where adulterations may be practised are sufficiently numerous.

There can be no doubt in the first place, that drugs from foreign parts are often adulterated before they arrive in this country, either by those who prepare them, or by the merchants abroad, to whom they are in the first instance disposed of. *Scammony* and *Gamboge*, whose adulterations have been inquired into above, are ascertained examples of this kind; and *Opium*, *Cinchona-bark*, *Senna*, and many other articles from distant countries, are equally well known to receive there the extraneous ingredients which are recognized in them by the European pharmacologist.

Some of these adulterations are in all probability practised with a distinct purpose of fraud. Such may be assumed to be the object where the adulteration is of a kind which may deceive the British importer and wholesale druggist. In regard to some substances, such for example as *Opium* and *Senna*, the deception is frequently, perhaps generally successful. In the case of opium I feel satisfied, that, so long as the wholesale druggist trusts to its external characters alone, he must be liable to be sometimes deceived. It is not easy otherwise to account for instances, which have come under my notice, of opiums widely different in real value having been bought and sold at nearly or absolutely the same prices, where the transactions took place between experienced individuals in the highest walk of their trade. As to senna, so successfully is it adulterated, that some of the first members of the wholesale trade in London are scarcely aware, that the highest-priced variety of this drug, the Alexandrian senna, is never pure, but invariably mixed to a considerable extent with another and comparatively inert plant: At least they were not aware of this fact in 1834, when I had occasion to converse with them on the subject. In these, and all other cases of the like kind, there seems reason for suspecting, that deliberate fraud is practised by the foreign merchant or producer.

But there are other sophistications also practised by the producer or merchant abroad,—and these probably the most numerous,—for which he is only in part accountable, or which at all events he practises without any intention of deceiving the merchant or wholesale dealer in Britain. For the spurious articles are perfectly well known to the home trade; and the wholesale price varies regularly with the purity of the imported article, and even according to its exact degree of purity. It is impossible, for example, to imagine that the maker or foreign merchant has any fraudulent view to personal profit in adulterating *Scammony* or *Gamboge*, as he actually does, to the extent formerly mentioned; because the external characters of the different qualities are precise and such as cannot be mistaken by any one of common experience; their import prices differ accordingly to a great extent; and in fact I have found by analysis, that these prices indicate very accurately their relative purity. What then, must be naturally asked, is the object of this practice? Is it that the wholesale druggist may be enabled to impose on the retailer with the spurious articles? It would appear not. No retailer of moderate skill could be so deceived; and from many wholesale establishments the spurious drugs go forth for no more than their real relative value.

More opportunities of information than I possess would be required for investigating fully this apparent mystery. But I have had occasion to ascertain the true facts in respect to one instance of the kind, which will probably prove the type of many others of a similar nature. The conclusion to be drawn would seem to be, that the fault lies with the retailers, or must be shared between them and their customers. Whether such is really the case or not, it is not easy to decide. But I shall state the facts as they were communicated to me by a wholesale druggist of eminence in London, who authorized me to make them public. The subject of his communications was scammony, which he allowed is very rarely to be had pure from any wholesale establishment. The reason he explained to me was, that many of his customers in the retail trade,—and his own case was likewise that of all his brethren,—would not give a fair price for a pure article; that they did not ask for a pure drug, but for one of a particular price, often greatly under what it could be purchased for from the importer; and that on communicating with his Levant correspondent, and informing him what his customers wanted, he received for reply, that no Levant merchant could furnish good scammony at the prices proposed, and that it was therefore mixed up by himself and others with various proportions of chalk, to suit the varying demands of English dealers. The foreign merchant, whose letter I saw, complained of the necessity to which he was thus reduced of disgracing his occupation; sent specimens, five in number, of his several adulterations, specifying the proportion of chalk and of pure scammony in each; and requested his London correspondent to make the facts as generally known as he could to the medical profession. As one step towards executing his instructions, the information and specimens were made over to me; and on analyzing the latter, I found them to be composed almost exactly as represented.

It may be strongly suspected then, that some retailers are responsible for adulterations of the kind now alluded to;—that by unreasonably forcing down the price of some foreign drugs, they in some measure compel the merchant abroad to prepare spurious articles; which they receive, knowing them to be spurious.

Another quarter in which it may be supposed probable that adulterations are practised is in the establishments of the chemical manufacturers. From what was formerly stated in respect of iodine and the hydriodate of potash, it is plain that in some of these establishments spurious drugs are wilfully prepared, and fraudulently sold. In one of the instances adverted to, a representation was made to the manufacturers at my request, but without occasioning, at least for a twelvemonth, any improvement in the quality of an article which at the time had an extensive sale in both England and Scotland. I have met with other instances somewhat similar. I have also met with instances where upon inquiry the inferior quality of the preparation was found to have arisen from accidental oversight, and with others where the cause was in all probability the want of adequate skill. It must be farther added that a few expensive drugs, the produce of the chemical manufactories, are always impure, because they cannot be purified except at an enormous loss, while even in their impure condition they are both sufficiently dear and also quite active enough. Thus strychnia and veratria, as prepared for medical use, are invariably very impure, to the extent generally of at least 50 per cent, being never prepared in a state of purity except for the scientific chemist; and the reason simply is, that in their ordinary commercial state they are sufficiently energetic and very costly, while the pure alkaloids possess no particular advantage in a medicinal point of view, and could not be sold for less than twice or thrice the cost.

From such inquiries as I have hitherto been able to institute, it would appear, that, deducting, as seems reasonable, the instances where the impurity is either allowable or accidental merely, the adulteration of chemical drugs by manufacturers themselves is very far from being prevalent. There is on the contrary great emulation among chemical manufacturers to produce articles of the finest quality; very many of their most important products are in all probability never intentionally adulterated; and certainly no retailer can be at any loss to obtain by far the greater part of drugs of this sort in a state of sufficient purity for medical use. A curious illustration of what is now said, which lately came under my notice, may be worth mentioning here, because it relates to a set of substances that have often been thought to be very impure. In consequence of having heard practitioners express their belief that corrosive sublimate and calomel are frequently adulterated, and in particular that the latter is often adulterated with the former, I examined both salts as they are sold in Edinburgh; and after a careful analysis of five different specimens of each, some from first-rate establishments, others from the most insignificant shops, it appeared that the least pure specimen of corrosive sublimate contained 97 per cent of real salt,—that the least pure of the specimens of calomel contained 96.6 per cent of genuine salt,—and that of ten calomels from ten different shops not one contained so much as a 500th of its weight of corrosive sublimate.

Farther, I am inclined to think, that where chemical drugs are adulterated by the manufacturer, the source of the practice is frequently, not fraudulent intention on his part, but,—as we have already seen to be the case in regard to some spurious drugs of foreign origin,—the necessity of meeting the orders of customers, who will not give the full price for a genuine article. There is no other apparent reason why a drug which ought to be tolerably uniform in its nature, such as the spirit of nitric ether, should be sold to retailers at prices so widely different as at present. There is no attempt at imposition on the part of the manufacturer, each quality bearing its own price. The purchaser of spurious articles cannot but know their quality from their price; and consequently he is chiefly to blame for their being introduced into the market in the first instance, as well as for ultimately dispensing them to the public.

The next quarter in which adulterations may be practised is in the establishments of the wholesale druggists. There is still indeed another description of persons, besides foreign merchants and home manufacturers, through whose hands we have seen that many drugs pass before reaching the wholesale dealer,—namely the drug-brokers. But it is not conceived that adulterations to any material extent are practicable in that quarter, because the articles which pass through the drug-broker's hands are solely of foreign origin, and usually remain in bond in the public warehouses till disposed of by him, being sold chiefly by sample. The wholesale druggist, who may be said to be the great organ of communication between the retailers on the one hand, and the foreign merchant, home manufacturer, and herbalist on the other, has been very generally, though somewhat vaguely, accused of being the chief cause of the extent to which adulterations are now practised. I believe it will be nowhere denied, that a considerable proportion of the impure and spurious drugs, now currently met with in the shops, are fabricated originally in the warehouse of the wholesale dealer. But, after what has been stated as to the adulterations practised by the foreign merchant and producer, a question naturally arises whether the wholesale druggist is entirely to blame for some of those which *he* practises. That there are unprincipled men in this branch of trade, as in every other, who make profit of their customers' ignorance by fraud and imposition, may be readily granted. But considering, that a great proportion of wholesale druggists do not make more profit by the sale of spurious articles than by those which are genuine, and that they do not necessarily sell the former as such, we are unavoidably forced to lay the blame on those persons who, for whatever reason, are purchasers at prices known and declared to be inadequate.

The more the practices of the trade are inquired into, the more must one become satisfied of the general fairness of the wholesale dealers in their department of it; and at all events no retailer need be at any loss to obtain from them the best and purest drugs, provided he will pay the fair market price of them. I must also add, that from several of the wholesale dealers of the metropolis I have received, without possessing any claims whatever on their confidence, the most unreserved disclosures as to the state of the drug-trade, accompanied with expressions of unequivocal regret that they should be compelled to seem accessary to the frauds which are practised on the public, and with declarations of their willingness to co-operate in putting an end to them.

The farther then we proceed with this inquiry, the more reason does there appear for suspecting that the adulteration of medicines, in the shape in which they are made up for the retail market, is of a piece with one of the common vices of trade; and that some persons, although they do not with their own hands fabricate the spurious articles sent forth by the wholesale druggist, chemical manufacturer, and foreign merchant, are essentially not less instrumental in fabricating them, by requiring that they shall be supplied at a price for which genuine drugs notoriously are not to be obtained, and by receiving and dispensing what they know to be sophisticated.

But this is not the only kind of imposition on the public for which some retailers have to answer. Other adulterations are also practised directly in their own establishments. Such for example is the chief source of many spurious galenical preparations, the greater part of which must necessarily be made by the retailer for occasional consumption. Not a few of these indeed are of low quality, simply because the crude drugs from which they are prepared are themselves inferior. But besides, there can be no question, from such facts as those stated above in regard to laudanum, that the galenical preparations often owe their inferiority to more direct interference on the part of the retail dealer.

It does not seem necessary to inquire here into the several causes that have led to the practices among retailers now adverted to. But it is only fair to them to mention, that one obvious cause is the absurd propensity of many of their customers to value medicines rather by their cheapness than according to their quality and efficacy. It would be wrong were I not also to express my perfect conviction, that the profession of chemist and druggist contains many highly respectable individuals, whose undeviating desire is that no medicines shall either enter or quit their establishments except what are of undoubted purity, and who exercise a degree of skill and care to secure that object which would scarcely be believed by those not conversant with the nature of their trade. Nor can I advert to this circumstance without being farther called on to acknowledge, that I have been indebted for a great deal of valuable information on the very subject of the adulteration of drugs to several members of this profession. One gentleman especially, in extensive trade in this city, whose name for obvious reasons cannot properly be mentioned, has in a manner thrown open his whole establishment to my most minute inspection, and obtained for me a great part of the opportunities of instruction I have enjoyed. It may be well perhaps to add, that I have thus become cognizant of two general facts of no mean consequence in the present enquiry:—that on the one hand, in the present state of matters the most skilful and conscientious in the retail trade cannot always protect themselves against serious imposition,—and that on the other hand, among its respectable members there is no want of inclination to co-operate in any steps that may be taken to enhance the respectability of the profession, and to render the unprincipled amenable to the public for their misconduct.

III. It now remains to consider the last head, under which it was proposed to discuss this subject,—namely the measures by which it seems most practicable to accomplish the prevention, or at least the abatement, of the present practice of adulteration. If the Colleges move in the matter, it is right that they should not go before the public without being prepared to recommend the adoption of certain checks; and therefore the following hints are thrown out for their consideration.

1. In the first place there can be little doubt, that, both for this and various other important purposes, the profession of chemist and druggist ought to be elevated as far as possible by an improvement in education, and protected by some of the rights due to a legally constituted Society or Incorporation. I have heard the Government of this country blamed for not having instituted such a body long ago; and in my opinion the evils which have resulted from the neglect on this head are far deeper and more extensive than most persons are aware of. On the very face of the question it certainly appears extraordinary, that, while in every other great European kingdom the profession of retail druggist is a highly respectable one, closely connected with science, incorporated by statutes, and exercised only by those who have undergone an express course of study, and been licensed after examination,—in Britain alone is it allowable for any man, no matter how ignorant and uneducated, to assume the name and character of chemist and druggist unchallenged.

The advantages of an institution for the protection and improvement of Pharmacy are manifold. For first, by conferring a certain *status* on the followers of what ought to be a scientific art, their character and respectability cannot fail to be greatly raised. Then, it will at once furnish the means of pointing out to the public those who are worthy of confidence. Farther, it is an important preliminary for the establishment of a board of education, by which the studies of the future members of the profession may be regulated, and their fitness for entering on it ascertained by examination. But again, it is also a necessary step for the accomplishment of one of the measures on which I am disposed chiefly to rely for abating the practice of adulteration, namely an effectual visitation of the druggist's shops. And, lastly, an institution of this kind appears not unlikely to promote the interests of science, more especially of chemical science. It is not trade alone, and the immediate interests of the public, which have suffered in this country by the want of an institution for regulating and encouraging Pharmacy. Science, in this, as in many of its other departments, has been a deep loser by the ignorance or supineness of our successive governments. In France every *Pharmacien*, and in Germany every *Apotheker*, must have undergone a liberal education; and in particular he must have made chemistry a subject of careful study. And what has been the result? Simply, that this profession has supplied in each of these countries a multitude of the most eminent scientific chemists of

Europe. In Britain, alas! we look in vain for a single chemist worthy of the name among those exercising the same profession.* And to what is this lamentable fact to be ascribed, except to the circumstance that in Britain all may, and most do, exercise it without any particular education at all, either in chemistry, or in other liberal arts or sciences? Germany and France may each number ten chemists of celebrity for one to whom Britain can point. Whence can this arise unless from the almost total want with us of a legalized profession to foster the science?

It cannot be expected that in the present place any details should be entered into as to the mode of constituting a Society of Pharmacy. But certain general principles may be here adverted to as essential to its success. 1. Its affairs should be entrusted to a Board, whose chief duties should be the examination of candidates for license and the visitation of druggists' shops. 2. In order to impart at once a due degree of respectability and some scientific character to its constitution and proceedings, it would be right that this board should in the first instance at least consist in part of members from the other branches of the medical profession. 3. While considerable liberality might at first be allowable in the admission of licentiates, these should eventually consist only of individuals who have undergone a certain course of study and an examination as to their fitness to practise pharmacy; and candidates should be required to produce evidence of possessing a competent knowledge of at least the following branches,—namely Latin, Chemistry, Botany, Practical Chemistry, Practical Pharmacy, and Materia Medica. 4. Licentiates of the college should be required to abandon medical and surgical practice. 5. It is not conceived to be at all necessary or even advisable, that all chemists and druggists should be compelled to apply for a license. Entrance into the body may be safely left optional, at all events for some time,—but with the condition, that every unlicensed person who may assume the title appropriated to the licentiates of the body shall by doing so incur a severe penalty.

2. The second measure by which the frequency of adulterations may be in some measure checked is by our Colleges of physicians adopting in their pharmacopœias an addition, by means of which the attention of practitioners and of druggists may be pointedly turned to the most simple and accurate criterions for determining the requisite purity of drugs, and their freedom from certain known impurities. An alteration of this kind was re-

---

* I am informed the late Dr Murray commenced life as a retail druggist. But this and any similar instances do not affect the argument.

solved on a few years ago by the Edinburgh College of Physicians, and was proposed by them to the sister college of London in the course of certain negotiations towards the establishment of a conjunct or National Pharmacopœia. The London college, though apparently disinclined to the change at first, have since endeavoured to adopt it in the late edition of their Pharmacopœia. But, if the present were a fit occasion for criticising that publication, it would not be difficult to shew that this department of it is not exactly fitted for the practical purposes here contemplated.

From such attention as I have been able to give to this subject, I feel assured that a set of rules may be devised for almost every important drug, mineral, vegetable and animal, which any one may apply with the ordinary knowledge of practical chemistry now acquired by every medical student educated at the school of this city, and by means of which it may be ascertained that the customary adulterations are absent, and each article of the requisite degree of purity. It is undeniable that such a method of investigation, which combines chemical and external characters, is infinitely more precise and searching than the latter characters singly, which at the present moment are almost alone employed by practical men, on account of their ignorance of the former.

3. In the third place a great proportion of adulterations would be efficiently checked by a well organized system of visitation of shops. I confess that at one time little advantage seemed to me attainable by this measure. The length of time required to make a thorough inspection appeared so great as to render it impracticable for a moderate body of individuals to examine properly any material number of establishments even once or twice a year without their whole time being devoted to the duty. But, since becoming more familiar with the external characters of drugs, as well as the applications of chemical analysis to the discovery of their adulterations, and since witnessing more especially the extraordinary tact and rapidity with which druggists of experience can ascertain the respective qualities of numberless samples of some kinds of drugs placed before them at the same time,—I no longer entertain any doubt that an effectual visitation of shops may be instituted by a properly organized body. For the success of a system of inspection it seems essential that a committee of inspectors should be appointed for each metropolis in the empire; that the members be nominated by the general body; that they have the power of nominating assistants or deputies in country districts; that they shall receive a salary in proportion to the duty discharged; that they shall be so numerous as to ensure the visitation of every shop at least twice a-year; that penalties be inflicted for the wilful possession of spuri-

ous drugs; and that these penalties be recoverable by a simple legal process.

Some may argue in opposition to the views here expressed of the utility of inspections, that the measure has been already tried in this country, and found to be inoperative. It is true that the Colleges of Physicians of London and of Edinburgh possess the right of visitation, and that this right has been long abandoned by the latter college, and is practised by the former with no material good effect. But it would be an easy matter to show that a College of Physicians is not the proper body with which to entrust so peculiar a duty; and in point of fact, though there were no other reasons for failure, it is quite sufficient to entail disappointment and ill-success, that such a body cannot be expected to produce a competent number of individuals of adequate practical skill. This line of argument, moreover, is very effectually answered by referring to the experience of France and Germany, where the task of visiting shops is lodged in the hands of the most eminent members of the Pharmaceutic Colleges, and where the inspections are consequently understood to be made with regularity, and vigour, and excellent effect.

In the fourth place, some might think that an effectual check against many adulterations would be found in similar visitations of the warehouses of wholesale druggists; which might be instituted the more easily, and carried on the more efficiently, that these establishments are few in number and confined to a few large towns. But insuperable obstacles exist to such a measure. It would be considered invidious to subject individuals to the superintendence of a body which it could scarcely be any part of their interest to join as members. Many wholesale druggists make preparations, both chemical and galenical, the processes and apparatus for which they are entitled to keep secret. Most of them supply to other trades besides retail druggists a great variety of drugs; which, for any other purpose except medicinal use, may be of inferior quality, without material injury to the public, and which, therefore, it would be impossible to prevent them from vending in such a state. Besides, while an inspection of wholesale warehouses would prove but a trifling check on retailers, it would appear from what was formerly stated, that an effectual visitation of the retail shops, and an improved education of retailers, would soon extinguish in a great measure on the part of wholesale dealers the reasons which at present exist for practising adulterations. But farther, a considerable check might be imposed on the malpractices of unprincipled men in the wholesale trade, and also, it may be added, in the trade of manufacturing chemist, by enabling the retailer, who may have been convicted of possessing spurious drugs, to recover the penalty from manufacturers or wholesale dealers, where he can prove that the adulterations had been practised before the articles left their establishments.

Such are the measures for the prevention of adulterations, which appear the most easy to enforce, and most likely to answer their object. That difficulties will be met with in laying down the details, and that obstacles will arise at first on applying them in practice, no one can pretend to deny. But no useful object was ever attained in a civilized, and most of all in a free country, without serious difficulties and obstacles to be surmounted. And I am not willing to allow that the obstacles in the present case are at all likely to prove insuperable; since it will be generally conceded that the object in view is most important, the means obvious and practical, and opposition not to be dreaded where alone it might prove powerful,—namely on the part of retail druggists;—for it would be very extraordinary that they, at least the better class of them, should oppose a measure tending so much and so directly to increase their professional as well as their individual respectability.

Neither on the other hand can it be imagined that the several checks which have been enumerated exhaust the possible list of corrective measures. Others will in all probability present themselves when the inquiry shall have attracted more especially the attention of druggists both in the retail and wholesale trade; to whose opinion, without a doubt, great deference ought to be paid. Without going any farther into the matter, I may suggest for example, whether means may not be found for preventing altogether even the importation of many spurious drugs, which are fabricated in foreign countries, and which it would be exceedingly easy to detect in their passage through the Custom-house. It might also be considered whether advantage might not be derived from the stated publication of authentic lists of the price of genuine drugs, and the announcement from authority of recently observed adulterations. But these and various other subsidiary measures will be better left for that ulterior inquiry which it is hoped will be instituted upon the whole question.

ART. II.—*On Laryngismus Stridulus, or Spasm of the Glottis.* By WILLIAM KERR, Surgeon, Corresponding Member of the Medical and Physical Society of Calcutta.

THE disease which is the subject of the following remarks is one which has not till lately attracted attention, and even yet is perhaps little known to many members of the medical profession. It has been described more or less accurately under at least fourteen different titles, and is now recognized by the names of Spasm of the Glottis, *Laryngismus Stridulus*, and Crowing of Children. Its more common names in older authors were Spasmodic Asthma and Spasmodic Croup.

The most marked symptom, and the one from which the disease has obtained its different appellations, is a difficulty of breathing which attacks the child instantaneously, and which, during the short time it continues, gives to the respiration a crowing sound like that of croup. Frequently, however, the sense of suffocation is greater than in that disease, and occasionally the glottis is entirely shut for a short time, giving rise to most distressing struggles for breath, or even producing instant and fatal suffocation. On the other hand, attacks of crowing are sometimes so slight as to be just discernible.

The age at which children are most liable to the complaint is from six to eighteen months. I have known symptoms manifest themselves as early as eight days after birth, and I have never seen it in children above the age of three years. It almost always commences in winter. When summer comes in, it generally yields to appropriate treatment; but if care be not taken, is apt to return in the succeeding winter. The children who are most liable to it are those of a very full and large habit of body, though I have often seen it in others. Dr Marsh says, that all the cases of this disease which he has witnessed have occurred in children, either themselves exhibiting marks of the strumous diathesis, or sprung from scrofulous parents; and Dr Ley, the latest author upon the disease, seems to be nearly of the same opinion. In giving my own experience I must say that I have seen it not unfrequently in children in whom I could discover no mark of scrofula, and whose parents, as far as I could learn, had never been affected with that disease. It is quite certain, however, that the children of some families are more liable to *laryngismus stridulus* than those of others.

Frequently the first symptom is a wheezing in breathing, apparently from cold. When spasms or fits of crowing do come on, they are for the most part slight, and, not being productive of any evident injury, excite no alarm, and are not supposed by the parents or nurse to be indicative of disease. The attacks of spasm, however, becoming more severe and frequent, a medical practitioner is consulted, or perhaps is hastily summoned on account of the occurrence of convulsions, a frequent attendant upon *laryngismus stridulus.*[*] By the time the disease attracts attention, or afterwards during its continuance, other symptoms are generally found to exist besides those simply of an affection of the glottis. The thumbs are turned into the palms, the hands are more or less clenched, and when opened by force immediately return to their former position. The feet are turned inwards and downwards, and the backs of the hands and feet are swollen. These symptoms are most distinct when the crowings are numerous, or when convulsions are threatened; at other periods they are seldom present. For a day or two after an attack of convulsions, and sometimes when convulsions have not taken place, the thumbs are often so much and so constantly pressed into the palms, and at the same time the fingers bent and stiff, that the child cannot hold a piece of bread. After a convulsion I have likewise seen an inability to grasp any thing, owing to a temporary paralysis of the hands, the thumb and fingers not being spasmodically affected. I met with one case in which the feet and hands, which were bent, were sometimes so painfully tense, that pressure upon them could not be endured. In this instance, indeed, the sufferings of the child proceeded in a far greater degree from the pain of the hands and feet than from the crowing. In severe cases, the child does not void urine as frequently as in health, and the quantity of this secretion is diminished. A symptom likewise, which only occurs in severe cases, is one of a paralytic nature, being an inability to swallow liquids, except when given in small quantities. In such cases, when a draught of water for instance is put to the child's mouth, and an attempt made to swallow as rapidly as in health, the greatest part of the water returns through the nostrils, the child not giving any indication of pain in the throat. Soft food is swallowed more easily; but, even this, if the disease become worse, is swallowed with difficulty. Another paralytic symptom is inability to walk or to stand erect. These symptoms show that this disease has a greater connection with paralysis than with spasm. In a few severe cases which have lately occurred to me, the children have been later in attempting to speak than others of the same age. My observations, however, have not been sufficiently extensive to enable me to say whether this belongs to the disease. In a few cases, the buttocks or groins become red, tender, and exude watery lymph.[†]

---

[*] A case which strongly illustrates these remarks is contained in Marsh on Spasm of the Glottis. Dublin Hospital Reports, Vol. v. p. 604.

[†] The following extracts from my notes will convey the best idea of this symptom which I am able to give. " In the course of half an hour after a severe attack of crowing, the buttocks became red and tender, and in an hour longer exuded watery lymph. This singular affection commenced with the *laryngismus*, and de-

In perhaps every case of the disease the buttocks, even when well covered, are cool, as if newly washed. In some instances the child has a cough, the nose is stuffed, a greater than usual quantity of mucus is secreted, and the respiration during sleep is noisy. I am uncertain, however, whether these symptoms have any direct connection with the disease, or are merely the effects of cold. Many of the children affected with *laryngismus stridulus* have a strong disposition to be in motion, which manifests itself at a very early age, often long before the commencement of crowing. When in the nurses' arms such children throw themselves backwards and forwards, and are apparently with difficulty prevented from falling to the ground. When laid upon the floor they crawl about much more than other children. The same child, however, who is restless in the mother's arms may be unable to walk or to stand erect. In general those affected with this disease are easily fretted; an unfortunate circumstance, as any trifling vexation is apt to bring on a paroxysm of crowing. Great irregularity exists in the occurrence of the preceding symptoms. In some instances few of them are found, and in others a greater number. They may be expected to develope themselves most fully when the disease is severe or protracted.

On some days from twenty to thirty attacks of crowing will occur, and on others none will take place. During some weeks the crowings will be numerous, and during other weeks there may be very few. Frequently the child is awakened out of sleep by one; at other times the paroxysms come on from being fretted, or exposed to a current of cold air, or without any evident cause. During an attack the sufferings appear to be occasioned wholly by the want of air, and are not unfrequently so great that the child's face becomes somewhat livid. After the paroxysm is over, the child generally cries for a short time, but is soon apparently as well as before the attack. When such attacks, however, become numerous, the child does not sleep well, and its appetite and strength are diminished. When they are neither severe nor frequent, the appetite is good, and the child is apparently well.

Instances have occurred of a paroxysm of crowing terminating life, by the glottis remaining as long shut as to occasion suffocation; but in general danger proceeds from the occurrence of convulsions. These are to be expected whenever the crowings become numerous. There is no immediate precursor to give warning of the onset of a convulsion, which will frequently come on

---

clined as it abated. No cutaneous disease existed any where else, and no cause can be assigned for its occurrence, unless it be regarded, as I believe it to be, one of the symptoms of the disease." In another case it is said, "Constipation was generally attended with tenderness and rawness of the skin of both groins. This affection usually came to a height in the course of an hour from its first appearance. It declined rapidly after the bowels were opened."

when the child is in good spirits, sometimes while at the breast, or amusing itself, or in the act of being dandled by the mother or nurse. A convulsion will likewise take place during sleep, or after a long and apparently sound sleep. Convulsions sometimes arise out of a paroxysm of crowing, and at other times they come on without such precursor. They are sometimes succeeded by insensibility, and at other times the child becomes sensible as soon as the fit is over. In general, when the disease is approaching a fatal termination, the epileptic fits become more numerous, and the child dies apparently rather from the effects of convulsions than from any affection of the glottis.

Laryngismus seems to me to be almost always a consequence of cold. I have known it come on for the first time immediately after exposure to a cold wind, and cold in any shape always aggravates it. The disease occasionally commences in summer, but I believe only when the weather is cold, especially if the child reside in a cold or damp house. Authors generally regard dentition as a cause of this malady. Among these is Dr Marsh ; but his cases, though somewhat numerous, do not seem to me to confirm this opinion. With, perhaps, a single exception, indeed, they lead to the conclusion that teething does not give rise to spasm of the glottis. My own experience makes me doubtful of the propriety of admitting dentition as a cause of the disease ; the growth of the teeth is certainly retarded by the continuance of laryngismus.

Last year an elaborate work was published by the late Dr Ley, the principal object of which is to show that this disease is the consequence of a paralytic affection of the glottis, caused by enlarged cervical or bronchial glands compressing one or both of the recurrent nerves, and that this may be the case though the tumefaction be so little, or in such situation as not to be discoverable without dissection. Dr Roberton, in the London Medical Gazette, Vol. xiii., gives a fatal case in which no enlargement of these glands could be discovered, though the body was examined by an expert anatomist ; and he naturally concludes, that enlarged glands may be a coincidence, but cannot be regarded as a cause. Mr Wakley, in the Lancet of July 29, 1837, says, that " he possesses more than one case of tubercular affection in children, where the pneumogastric nerve has been completely flattened by the pressure of tubercles, without giving rise to any remarkable disturbance of the function of respiration." Laryngismus, therefore, having been proved to exist without glandular enlargement, and enlargement without laryngismus, it will be safest to pause before we adopt Dr Ley's conclusion.

Drs Clark, Marsh, and others, have observed bending of the hands and feet to be a frequent accompaniment of laryngismus. Dr Ley, however, labours to prove that this symptom is not essentially connected with the disease, and he makes a similar attempt to convince his readers that convulsions are equally accidental attendants. He was evidently not aware of the other symptoms which I have mentioned, and if he had, he would probably have been very unwilling to admit them; for though pressure on the recurrent nerves may possibly cause an affection of the glottis, it does not offer an explanation of the other concomitant symptoms.

When the bodies of children who have died of laryngismus are inspected, no deviation from health is observed in the larynx or trachea. If convulsions have occurred, the morbid appearances in the brain are similar to those produced by convulsions unaccompanied with laryngismus.

In describing the treatment, let it be supposed that the practitioner is called for the first time in the winter season. Cold being undoubtedly a powerful exciting cause of the disease, the child should be warmly clothed from the head to the feet; and if the patient happen to be one of those who have a strong propensity to crawl about, worsted drawers, or something of the same kind, will be found very useful, as petticoats do not keep the limbs sufficiently warm. A cold state of the body is always followed by an increase in the attacks of laryngismus, and children in this complaint, generally cooling very readily, the most watchful attention is requisite to warm the child or increase clothing when necessary. I have frequently seen an exacerbation produced by a diminution, and removed by an increase of clothing; indeed Dr Ley justly remarks, that "warm clothing is all important." The temperature of the apartments in which the child is kept should likewise be comfortably warm; but as fresh air is essential to the cure, the apartments should if possible be of such a size as to admit of attention both to warmth and freshness of air. In the winter season I have known an aggravation of the disease take place from carrying the child for a short time into a room without a fire.

Though there is generally a great tendency to constipation, not unfrequently the bowels are loose, and the same child may labour under alternate constipation and looseness. During constipation, the stools are tough and adhesive like putty, and are generally green or dark-coloured; when diarrhœa is present the first part of every stool is hard and dry, and the last nearly as liquid as water. Stools procured by medicine are more natural, that is, less tenacious and less watery. When constipation is present a dose of some purgative, such as castor oil, calomel, senna, croton oil, or rhubarb and magnesia, should be given daily, so as to procure as nearly as possible two free motions in this space of time. If only one occur in the course of a day, it will be too bound, and if more than three take place, the child's strength will diminish. I have frequently questioned mothers and nurses on this point, and their testimony has uniformly coincided with what I have now stated.[*] When attacks of crowing are severe and numerous, the practitioner should not trust altogether to a purgative by the mouth, but should procure an immediate evacuation of the bowels by an enema or suppository. In a case such as this, I have known leeches applied, but without benefit. Opening the bowels freely is the important remedy. If this be neglected, the crowings will increase, and if attended to along with other remedies, they will diminish. A few months ago, my friend, Dr Hill of Greenock, mentioned to me that he had found a mixture of oil of turpentine and castor oil exceedingly beneficial, indeed almost a specific in *laryngismus stridulus.* I have not yet, however, had an opportunity of giving it a trial. When diarrhœa accompanies the disease, it should be checked by laudanum, along with a laxative, such as rhubarb and magnesia, or castor oil. I have attempted to restrict myself to laudanum alone, or a laxative alone; and in such instances I was uniformly unsuccessful, so that I have no hesitation in recommending the combination of the two. Indeed, if the nature of the stools in the diarrhœa accompanying laryngismus be considered, it will be evident why both an astringent and a laxative are necessary. In cases where laudanum disagrees, or where the diarrhœa becomes chronic, the persesquinitrate of iron should be substituted.

When the child is fretful, common sense will dictate that it should be soothed as much as possible, in order to avoid the paroxysms which fretfulness so readily occasions. A warm bath, the skin being afterwards carefully wiped dry with a warm towel, is useful in allaying uneasiness, and likewise in diminishing perspiration, which, as the weather becomes warmer, is often very troublesome. In children who are naturally constipated, a dose of a purgative produces a wonderfully soothing effect, the child generally falling asleep, as another child would do after a dose of laudanum. An opiate is scarcely ever necessary to relieve uneasiness and procure sleep, except when diarrhœa is present; in other cases it is so apt to produce costiveness, that it is generally injurious. I have known a pretty large dose of laudanum, given on several successive nights in order to obtain sleep, not only fail in this, but from making the bowels much more constipated, become the cause of a sudden and great aggravation of all the symptoms of the disease, which was immediately removed by the operation of a brisk purgative.

Dr Marsh directs attention to be paid to the nourishment afforded by the nurse, and if there be reason to believe that her milk is not of good quality, that another nurse should be procured.

---

[*] Dr Merriman says that aperients should be given so as to procure two copious motions daily.—Notes to Underwood on Diseases of Children.

The child sometimes manifests a strong craving for animal food, which, as long as it digests well, may be given with advantage. Brandy or whisky toddy often do good when diarrhœa has continued so as to produce some degree of exhaustion. A child who was affected with laryngismus, accompanied with diarrhœa, but without convulsions, swallowed at least a wine glassful of whisky, and not unfrequently two with benefit, every day during several months in winter and spring, and when summer arrived obtained a perfect cure by removal to the sea shore. When weakness has come on from the long continuance of laryngismus, alcoholic stimulants seem in this condition of the body to be useful, the bowels being at the same time kept open. Dr Marsh mentions that Dr Johnson, in a case of asphyxia from laryngismus, restored the child from apparent death, by having instantly recourse to artificial respiration.

As spring advances the increasing mildness of the weather will produce an increased tendency to perspiration, which, if not counteracted, will lead to the most unfortunate results. Indeed, till I read the remarks of Dr Cheyne,[*] and Dr Marsh on the effects of fresh air in curing this disease, the most fatal period in my practice was the months of April and May, and after having conducted the treatment pretty successfully during the apparently more critical months of winter, I had the mortification of seeing not a few of the little patients cut off on the approach of summer, when I was flattering myself that the worst was past. When the child begins to perspire, the constant dampness of the skin is apparently productive of frequent cold, the paroxysms of crowing increase in frequency, and these, when numerous, as has been already remarked, are pretty certainly accompanied with convulsions. The whole symptoms of the disease are now very formidable, and, if not speedily checked, will lead to a fatal termination. Perspiration being the first indication of this unfavourable change should be carefully watched. In a house not very well ventilated, it is often so great, that if the clothes are not changed oftener than once a day they become quite wet by bed-time. If the weather is too cold to permit the child being carried out of doors, the apartments should be kept cooler and better ventilated, care being taken not to expose the child to a current of cold air. The clothing may require to be lessened, but in this great caution is requisite. The warm or tepid bath employed frequently will insure a dry skin at least for some little time. At first the child is often very much afraid of being put into a bath, and its fears excite attacks of crowing. The best plan of procedure is to accustom the child to be washed in a basin, and gradually to increase the size of the vessel as the child becomes reconciled to the water. If the house be such as not to admit of any material improvement, I would advise a removal, if not to a country house, at least to one better ventilated. In the spring months I have seen a removal from an ill-aired house in a central part of the town, to a larger in a more airy street, productive of great advantage, though I have no doubt that a removal to a comfortable house in the country would have been better.

---

[*] On Hydrocephalus, second edition.

The weather still becoming warmer, the tendency to perspiration will again increase, when, to avoid coming dangers, the child should be taken to the country or sea shore, and when there, should be carried every mild or warm day for some hours into the open air, or, as Dr Marsh mentions, should almost live in the open air. The only precautions which I have to mention are, that at first especially, the child be not taken out when perspiring; if the day is hot that it should be kept under the shade of trees; and that it should not be taken out of doors in a cold day. The last caution is more necessary, as, when the practice of taking the child out has been commenced, a nurse or servant is apt to persevere in it without reference to any change which may have taken place in the weather. In my notes, I observe the case of a child who was much improved by exposure to the open air, after having been during the winter severely affected with both crowing and convulsions. For eight days preceding the 16th of May, this child had not a single attack of crowing; but on that day the weather suddenly becoming cold, while his clothing, which had been previously properly diminished, was not increased to suit the change, he was taken out of doors as usual, but with evident disadvantage, as fretfulness together with crowings returned, and a fit of convulsions occurred in the evening. The weather still continuing cold, he did not improve till his clothing was made warmer, and the cold caught removed. In the course of next month he became quite well. When the summer happens to be cold and wet, I have known children, who had been sent to the sea shore for purer air, return home very little improved.

With these cautions, however, there is no remedy which more certainly removes *laryngismus stridulus* than exposure to the fresh air. If the disease be slight, the house well-ventilated, and at the same time comfortably warm, the child may be cured before the season arrive for being taken out of doors; but if the disease be more severe, I have known it continue even in a most excellent house situated in the suburbs, and be speedily cured by a removal to the sea shore. In laryngismus, exposure to the open air acts as much like a charm as in hooping-cough; the crowings speedily cease, the child becomes more cheerful, acquires a better appetite, becomes stronger, perspires less, and sleeps better; indeed, he often falls asleep in his cradle as soon as he is brought into the house. A child, whose parents resided in a crowded part of the town, was removed to a more airy house, when the crowings almost immediately ceased, and did not return for three weeks. The weather becoming milder, however, the child began to perspire, the crowings came back to the extent of about six daily, and continued at this rate for eight days. He was then taken to the sea shore, and from the day of his removal, only two attacks of crowing occurred, one upon the way, and the other next day at the sea side.

The treatment which I have now sketched is that of symptoms which of themselves are seldom fatal. It yet remains to notice the treatment of convulsions occurring during the course of the disease. Since I became in some measure acquainted with the management of *laryngismus stridulus*, so as to be able to place more reliance on the accuracy of my observations than I could do when commencing the investigation of this malady, all cases of accompanying convulsions, when the bowels were costive, received benefit from the abstraction of blood. In milder cases, the application of one or two leeches was sufficient, and in more severe, the external jugular vein was opened by a lancet, and blood allowed to flow till the lips became pale. In some of these cases a cessation of the convulsions immediately followed, and the child was in every respect sensibly improved. A plump full-bodied child, who had repeated attacks of convulsions during the winter, was on several of these occasions bled with leeches, and once with a lancet from the jugular vein, and uniformly with benefit. The fits ceased, the child became more comfortable, and the perspiration diminished considerably. He had usually an excellent appetite, which before a fit, it is curious to remark, became keener than common; after a fit, however, it diminished, so as to be less than usual. The tendency of the bowels was at all times to constipation. No benefit was ever derived from spirituous liquors. In my notes I observe the following statement respecting another child. "For some time previously to the first fit he was unable to walk, or to stand erect, but since he recovered from the weakness consequent to the abstraction of blood on that occasion, he has regained the power of his limbs." I may here mention, that, owing to the full habit of body of most children affected with laryngismus, it is impossible to see or feel distinctly any vein except the external jugular. Owing, probably, to the same circumstance, children with this complaint have generally little colour. When insensibility continues after a fit, I have always or almost always found that the bowels are injuriously loaded, and a purgative enema, together with a smart purgative by the mouth, will be required. Being satisfied that in several instances of laryngismus accompanied with diarrhœa, brandy and

whisky have really been useful, were such children to be seized with convulsions, I would certainly hesitate very much whether I ought to abstract blood; but not having met with cases of this kind since I became somewhat familiar with the disease, I cannot venture to say any thing respecting their treatment.

Laryngismus stridulus may come under the notice of the medical jurist; the sudden and unexpected death of which it is sometimes the cause may offer a plausible defence in cases of child murder unaccompanied with marks of violence. In September last, a woman of the name of Semple or Drennan was tried at Glasgow for murdering her child, aged nine months, by drowning it in a canal, on the 10th day of June preceding. Her counsel, among other defences, argued that it had died in her arms in the street, in consequence of a paroxysm of crowing, and that the body had been thrown into the canal after death. She was found guilty, however, and afterwards confessed that she had put the child to death in the manner described in the indictment. With respect to this and other cases of the same kind, there is not at present, as far as I know, an instance on record, and, as far as regards my practice, I have not seen one where the child died of the very first attack of crowing.* But as the disease is often regarded by attentive and attached parents as a habit and not as a malady, it is quite possible that an accused person might never have communicated the fact of the child being affected with crowings to any neighbour or acquaintance, and might therefore have no evidence to bring forward to prove the previous existence of the disease. † The season of the year is of some importance in forming an opinion respecting the cause of death. *Laryngismus stridulus* is a disease of cold weather, and deaths from it take place most frequently from January till the latter part of May, and in this last month, as far as I know, only when the child has got into an alarming state, from the frequent recurrence of convulsions. I am not aware that a child previously not much indisposed has ever been known to die from an attack of crowing when the weather was warm. It is quite certain, however, that young children have died suddenly without any observed symptom of laryngismus, and with scarcely any previous ailment. Thus a child, nine months old, while playing in bed, suddenly stretched itself in an epileptic manner. The nurse, alarmed by its appearance, ran to render assistance, and on lifting it found its body and limbs quite rigid. No crowing was heard, no foam issued from the mouth, and the child died almost instantly. This happened in warm weather, and the child previously was supposed to have only a slightly disordered stomach, and to be in nearly perfect health. I am likewise acquainted with a couple who have lost two children equally suddenly. Their first born was put to bed about nine o'clock on a winter night, lively and apparently well, and an hour and a-half afterwards his mother, who had been in the same apartment almost the whole time, on going to his bedside, found him dead. This child was rather delicate, was generally peevish and uneasy, but had a remarkably keen appetite. Their second child, who was likewise delicate and fretful, when about the same age, was one night found dead in its mother's bosom. Their third and fourth died of convulsions after an illness of a day or two. None of the children were ever heard to crow. I am disposed to believe that, in the whole of these last-mentioned cases, death was caused rather by epilepsy than laryngismus, but the precise nature of the disease is of little importance to a jury. It is sufficient for them to be assured of the fact, that children previously in pretty good health may die suddenly. I regret that the body was not inspected after death in any of these cases.

---

* Even in cases where the predisposition is great, I have not known a first attack of crowing prove fatal. I am acquainted with two families, each of whom has lost two children in a paroxysm of crowing. In all of these the disease had lasted a longer or shorter time before the fatal event. The one of shortest duration had crowed a fortnight, another a month. This last for some days previously was supposed to be considerably better, and immediately before the last paroxysm was laughing and cheerful. Two of the children had some days before death, had a fit of convulsions. The whole of the deaths occurred in winter; three at the age of eight months, and one at eleven.

† Dr Marsh gives a very striking instance of this disorder, which gave no alarm to the parents till the occurrence of the fatal paroxysm of crowing. On dissection, seventeen hours after death, the *rima glottidis* was very much contracted. Next day, however, it was found to have recovered its natural dimensions. The larynx and trachea were free from disease. The lungs and right side of the heart were engorged with dark-coloured blood, the blood-vessels of the brain were likewise full.—Dublin Hospital Reports, Vol. v. p. 614.

Before concluding this subject, I shall only add the following abridgement of a case contained in my notes. A child from the beginning of December 1828 was subject to attacks of crowing, and from the middle of February to convulsions. From the beginning of March, however, till the middle of April he was much better, crowed little, and had not a single fit. But during the succeeding two weeks the disease became considerably worse, the attacks of crowing were severe and numerous, and he was thrice seized with convulsions. Early in May a paroxysm of crowing occurred, which ended in a convulsion. At first no danger was apprehended, as he seemed to be no worse than he had been for the preceding fourteen days, but apparently owing to respiration being too long suspended, the fit, in the course of a minute or two, terminated his life. An examination of the body was permitted, but time could not be spared to inspect any other parts besides the larynx and trachea, which seemed to be quite healthy. He had very much the appearance of a child who had died from suffocation; his tongue was protruded, and his countenance was livid.

Paisley, 1*st November* 1837.

ART. III.—*On the Evidence of the occasional Contagious Propagation of Malignant Cholera, which is derived from Cases of its Direct Importation into new Localities by Infected Individuals.*

By JAMES Y. SIMPSON, M. D., Fellow of the Royal College of Physicians, Physician to the Royal Public Dispensary, Interim Lecturer on General Pathology in the University of Edinburgh, &c.

IN the following communication upon the *questio vexata* of the contagious or non-contagious nature of malignant cholera, it is by no means my intention to enter into the consideration of the numerous different arguments that have been adduced, either in favour of that doctrine, or against it. I only wish to offer a few remarks upon what appears to me to form a part in the evidence for the occasional contagious character of this disease, that has not been sufficiently insisted upon, and to illustrate these remarks by some apposite examples, derived principally from observations upon the phenomena of its propagation in our own country; and I do so partly with the view of placing upon record, and collecting together the various series of cases which I shall have occasion to cite, and partly with the hope of inducing others to bring forward such analogous instances as may have fallen under their observation.

Before proceeding, however, to the more immediate consideration of the particular point of evidence which I intend to discuss, it seems almost indispensable (with a view of clearing the ground for the inquiry,) to premise, that, connected with the question of the contagious or non-contagious character of cholera, a long train of apparently very unnecessary discussion has arisen on the subject, whether the disease be, 1. an aggravated variety of the common sporadic cholera that has been described from Hippocrates and Aretæus downwards? or, 2. a new nosological species of disease which sprung up at Jessore, or simultaneously at Jessore and in other parts of the Delta of the Ganges, and of the kingdom of Hindostan, in August 1817? Without dwelling on this much disputed matter, I shall, for the present, merely observe, that it now appears to be admitted by all parties, that before 1817, and the years that have intervened between that and this period, cholera never spread itself in a *general* epidemic form over the different inhabited regions of the world; and if this be allowed to be the case, it seems altogether contradictory and unphilosophical to endeavour to account for its endemic and temporary prevalence in any individual part or parts of its course, by referring it to any of the common exciting causes of disease, such as irregularities in diet, temperature, moisture, &c., inasmuch as these supposed causes have been always in operation, but, as far as accurate medical records reach, they never once gave rise to the same specific effects,—to the same extraordinary combination and concourse of morbid phenomena in the animal economy, up to the period of the appearance of that epidemic which has now traversed with such fearful and fatal steps almost the whole circumference of our globe. All inquiry and reasoning on this point must, I conceive, ultimately force us into the belief, that cholera, in its wide-spread epidemic form at least, is a disease which is specifically new, and one that has hitherto appeared in certain places only, and for a limited time only in each place; and hence it seems impossible to avoid coming to the other conclusion, that the agencies or agency which gave rise to this new and specific form of malady must have been itself also of a new and specific character, and that the human economy has been subjected to its operation only in those localities in which the disease actually prevailed, and only during the temporary period of that prevalence.

Without stopping to consider the many fanciful theories which have been propounded in explanation of the general or epidemic prevalence and spread of cholera, such as those which have ascribed it to galvanism, to magnetism, or electricity, to the presence of insects in the air, of animalcules in the water, of certain deleterious and poisonous properties in the food used by man, &c.;—and without insisting upon the logical impossibility of accounting, as has been frequently attempted to be done, for the origin and propagation of a malady so *erratic* and *diffuse* in its course, by endeavouring to trace it to the action of causes that can only have a *local* and *limited* existence—as the effluvium from sewers, the malaria of stagnant water, the proximity of rivers, &c., I shall merely content myself here with observing, that, in medical etiology, three morbific causes only have usually been admitted as capable of accounting for the diffusion and spread of such general epidemic diseases. These three causes are, 1. a peculiar influence, property, or miasm, existing in the atmosphere; 2. an influence existing in or emanating from the earth; and, 3. and lastly, a contagious influence or effluvium generated in the human body while labouring under the disease, and capable of exciting the same specific disease in such predisposed individuals as are exposed to its action by direct or indirect intercourse with the infected.*

It is not my intention to consider, on the present occasion, the kind of negative evidence, or arguments by the method of exclusion, by which the doctrine of the invariable production of epidemic cholera by atmospheric or terrestrial morbific influences alone, seems capable of being refuted; and, without insisting on all the various forms of positive and negative proofs which might be adduced in favour of the contagious propagation of the disease, I shall proceed at once to illustrate that kind of positive proof or argument for its occasional, at least, contagious character, which it is my object in the present communication more particularly to insist upon and illustrate.

---

* It may be proper to state here, that in the present paper I use the word contagion as a generic term, signifying the transmission by specific poisons of specific diseases from the sick to the healthy, both by direct contact, and by the more indirect medium of air or of other fomites impregnated with the morbific effluvia generated in the bodies of those affected.

If we except the very distinct and, perhaps, I may say, incontrovertible proof of the contagious character of a few diseases, which is afforded us in the possibility of propagating these diseases from the sick to the healthy by direct inoculation, there is not, I conceive, any other kind of evidence of the contagious nature of any given malady more positive and determinate than that which is derived from tracing (where this can be effected) the mode of its importation into a previously healthy town or district, and the earliest steps of its subsequent dissemination among the resident inhabitants of this new locality. The mere circumstance of two or of several cases of any supposed contagious disease,—as of fever, dysentery, or cholera, having appeared simultaneously or in quick succession, among the inhabitants of the same apartment, house, street, or district, affords in itself, no direct proof of the contagious nature of that disease, as, on any doctrine whatever of its local production, the same fact ought necessarily to be observed. Accordingly we find that some non-contagionists have, in reference to cholera, brought forward this *local multiplication* of cases, as an argument for believing that the disease was in general the effect of the action of some common cause or causes peculiar to the affected localities in which it presented itself, such as a local miasm or other endemic morbific influence. The evidence, however, in favour of the contagious propagation of cholera, or of any other disease, assumes a different and much more positive character, when, in a place or locality hitherto unaffected, a case or succession of cases is observed to occur among the *resident* inhabitants, *subsequently* to there having sickened, and, it may be, having died amongst them, an individual who had caught the infection, by being previously exposed to it in *another* and perhaps distant locality, (in which the disease already prevailed,) and when the first cases among the resident inhabitants of the new locality can be shown to have occurred in some of those individuals who had happened to be brought into direct or indirect intercourse with the infected traveller. For in such instances, those *resident* inhabitants of the new and previously healthy locality who are attacked, having, as we presume for the present, no communication whatever with the other or diseased locality, *except through the medium of the infected individuals who had come from it*, we can only suppose that the disease was conveyed from it to them by the intercourse that they had with the persons of these individuals; and we know of no way in which this intercourse with their bodies or clothes could possibly have produced such an effect, except by means of that morbific action or process which pathologists understand by the term contagion. Indeed, if we were justified in making a direct and (as far as the nature of such an inquiry permits) a decisive *experiment* to prove the contagious character or communicability of any malady, could we possibly devise one less objectionable than the following? Having, in a place in which the said malady was prevalent, exposed a susceptible or predisposed individual to the contagion of the sick, we immediately send this individual off to a *distant* town or village, which has itself, with all the surrounding district of country, hitherto remained perfectly free from the disease; we then watch whether, after the infected stranger is, upon his arrival in this new and healthy locality, attacked with it, one or more of the resident townsmen or villagers who nurse him, or who happen to have other intercourse with him, become, in due time, consecutively affected with the same specific malady:—and if the disease, from want of efficient precautionary measures, afterwards spreads, we farther endeavour to observe whether it does not appear earliest in those inhabitants who had been in one way or other brought into connection with the first cases of it, and this previously to its having appeared in the persons of any of those inhabitants of the place who had escaped all intercourse with the sick stranger, or those immediately infected by him.

The case which I have here supposed is by no means an imaginary one,—for, with respect to cholera, exactly this experiment, under various modifications, has been successfully repeated for us by accident in a great number of instances during the course of the dissemination of the disease, both in this country and elsewhere, as we shall now proceed to show, by the details of the various series of individual local histories of the disease which we have collected.

SERIES I.

CASES OF IMPORTATION OF THE CONTAGION FROM AN INFECTED TO A DISTANT HEALTHY TOWN OR LOCALITY.

Bathgate.—In this village, which contains a population of nearly 3000 inhabitants, and is situated in West Lothian, eighteen miles west from Edinburgh, on the great road between that city and Glasgow, six cases only of pestilential cholera occurred during the prevalence of the disease in Scotland,—four of them in persons who came to the town from infected districts, and the two others in the female villagers who acted as nurses to these strangers. There were two importations of the disease. *

First, A middle-aged female stranger was allowed, secretly and contrary to the orders of the Local Board of Health, to enter one of the lodging-houses within the outskirts of the village, on the evening of the 20th April 1832. This woman had, as was afterwards ascertained, been for some time a resident in Glasgow, but she had gone two or three days previously to Edinburgh, (where the cholera was at that time prevailing,) in order to relieve some goods lying in a pawnbroker's shop. After having lodged in Edinburgh for either one or two nights, she set out again for Glasgow on the morning of that day on which she reached Bathgate. By the time she arrived at this latter place, she was *already* complaining of being unwell, having become indisposed upon the road; but her state was not such as to alarm the lodging-house keeper, or to prevent him admitting her. Having manifested, however, during the night well marked symptoms of cholera, her condition was early on the following morning reported by Mr Dixon, surgeon to the Local Board of Health, who immediately adopted all the means necessary to prevent the spread of the disease, and sent a female, who had been eighteen months resident in the village, to attend her as a nurse. The stranger died on the night of the 22d April, after an illness of about forty hours. Next day the village nurse, after being engaged in washing the clothes of the deceased, was seized with all the most marked symptoms of malignant cholera. She recovered, however, after passing through a very severe attack of the disease.

No other cases of cholera were seen in the village till the evening of the 27th of April, when the Second importation of the disease took place in the persons of three female mendicants, who had, the second or third day previously, left Edinburgh, having been lodging there in Blackfriars Wynd, where the disease was then prevailing. On the 25th, they were in the immediate vicinity of, and probably visited Newbridge, a small village at mid-distance between Edinburgh and Bathgate, and in which cholera was perhaps more prevalent and fatal, proportionally to the number of inhabitants, than in any other locality in Scotland, That night (25th) they slept at the farm-house of Niddry Mains, and while there, either one or two of them complained of being unwell, so much so that they did not reach the village of Broxburn, (which is only about a mile distant from the farm-house, and about two miles westward of Newbridge,) till the afternoon or evening of the 26th. Mr Andrew Millar, the son of the farmer at Niddry Mains, was obliged, as I am informed by Dr Thomson of Broxburn, to come out of church on the following Sunday (the 29th) from sickness, followed by an attack of diarrhœa and some vomiting, which continued for about two days. His father, who had been for some time in an infirm state of health, became suddenly much indisposed on the evening of the 4th May, had rice-water evacuations to a great extent during the night, with much sickness and sense of sinking, and when seen by Dr Thomson on the following morning was evidently in the collapsed stage of cholera, and died that afternoon. These two cases of the Messrs Millar, were, as Dr Thomson assures me, the only instances of the disease among the resident inhabitants of the extensive district in which he practises, with the exception of either one or two examples of persons who had been exposed to the disease in Edinburgh, and who had afterwards sickened at Broxburn.

---

* For much of the following information relative to the history of cholera at Bathgate, I am indebted to my friend, Mr W. Gilchrist. I have myself also had repeated opportunities of inquiring upon the spot into all the particulars, and the details here presented were, previously to publication, submitted to the revisal of the medical gentlemen of the place.

But to return to the three mendicants.—They took up their abode during the night of the 26th in a lodging-house at Broxburn, and endeavoured, as was afterwards confessed, to conceal the disease under which they were labouring. Next morning two of them presented such open and alarming symptoms of cholera, that all of them, however inhumanely, were forced out by the lodging-house keeper, and after lying on the public road for several hours, they were, by the local authorities of the place, forwarded in an open cart to Bathgate, a distance of seven miles. By the time they reached Bathgate, they were both in the stage of collapse, and were immediately placed in a room in the village jail, a somewhat isolated building, situated in almost the very centre of the town. The elder stranger sunk in thirty hours after her arrival, and the younger one, her foster child, survived only for about twenty-four hours longer. Three female nurses, all natives, and resident in Bathgate, were engaged to attend these cases,—a duty in which they were assisted by a niece of the elder stranger's, who had accompanied her. One of these three town nurses was attacked with cholera on the morning of the 30th, the day on which the younger stranger died; and she sunk under the disease in the course of about eighteen hours. On the same day also, the third remaining stranger, a girl of twenty, became affected with the disease, and died of the secondary head affection on the fourth day afterwards. Besides the four nurses that I have mentioned, there were also necessarily freely exposed to the contagion in Bathgate, the landlord and his wife to whom the lodging-house belonged in which the first patient died, and where her nurse was confined, as well as the four surgeons of the village (one of whom lived with the patients as a nurse,) the clergyman of the parish, who was most assiduous in his attentions to the sick, and a man who frequently visited them and acted as porter to the hospital.

None, however, of these or of the other inhabitants became affected with the disease, with the exception of the two nurses, and perhaps we may add, one of the surgeons (Mr Dixon) who had an attack of tormina and diarrhœa. The villagers in general, under a salutary dread of the disease, avoided as carefully as possible all intercourse whatever with the infected persons and houses.

All the district and villages more immediately around Bathgate totally escaped any attack of cholera. The nearest point at which the disease is known to have occurred was at Linlithgow, which lies about seven miles to the north, where one or two suspicious but not decided cases were observed. Towards the east, Mr Millar's of Niddry Mains, about eight miles distant,—and to the south, some cases to be afterwards mentioned, which occurred at Carnwath, ten or eleven miles distant, were, I believe, the nearest seen in these directions;—and on the west side the disease does not seem to have shown itself nearer than Clarkstone, a village thirteen miles distant, and in which it prevailed to a considerable extent. In this calculation, I do not of course include some instances in which the affection was observed in the passengers in the canal boats, and others who were passing through the district, or who came to it, after being already exposed in infected localities, and died without propagating the disease. One or two such cases were seen by the medical men both of Linlithgow and Broxburn.

Now in the instance of Bathgate,—the various circumstances connected with the appearance of cholera in which I have thus endeavoured as accurately as possible to detail,—if we adopt the idea of the contagious character of the disease, the fact of the nurses being infected *alone*, from out of a population of nearly 3000 inhabitants, is at once evidently distinct and simple in its explanation. If we deny, however, the contagious propagation of cholera, and endeavour to explain the circumstances of these cases upon the doctrine of the disease arising from a morbific influence, either terrestrial or atmospheric, we cannot, I conceive, avoid involving ourselves in inextricable difficulties. For if this supposed influence, whether terrestrial or atmospheric, was *generally* diffused over the soil or air of the town, how did it happen that it exactly attacked the persons, and the persons only of those that were attendant upon the imported sick?—Were the two unfortunate nurses, who were better fed, &c. than many of the other poor of the place, the only individuals out of the 3000 inhabitants of the village, and out of the whole surrounding populous district of country, that were predisposed in such a manner as to be affected with this diffused morbific agency? And it is perhaps important to observe, that they were both women between 40 and 50, and apparently of healthy constitution,—they were both volunteers in the service, so that we cannot ascribe the appearance of the disease in them in any degree to fear;—their duties as nurses were neither long continued nor severe, owing to these being divided among so many hands:—they were each allowed soup out of the common stock provided at the general soup-kitchen for the poor of the village, and had, in addition, a daily quantity of more solid and generous diet allotted to them. Indeed, if we do not admit in their cases the doctrine of contagion, it will be impossible, I fear, to point out any cause whatever, explanatory at the same time, of their unfortunate fate, and of the escape of the villagers in general. The atmosphere which the infected and uninfected breathed was the same, the soil on which they were placed was the same, and the various external agencies operating upon them were similar in all respects, with the exception of the *single* but all important particular, that the two nurses were in close intercourse with the imported sick, while the body of villagers were not exposed by such intercourse.

If again, the morbific influence productive of the disease was not generally diffused over the soil, or throughout the atmosphere of the village, but was merely *local* in its origin and site, how did it happen that the supposed local morbific condition of the soil, or of the air, existed below, or over the two houses containing the imported sick, and these two houses alone? And it is perhaps not unworthy of being remarked, that these two houses are situated at more than half the breadth of the village from one another,—that one of them occupies rather a low, and the other rather an elevated situation,—and that they are seated on two kinds of soil that are, I believe, widely different from one another in their geological nature.

Besides, the family among whom the first stranger died, and with whom her nurse continued to be lodged during the attack of the disease which she passed through, inhabited two of the lower and end apartments in a "land of houses," or large common dwelling, 90 feet in front, the various other parts of which were occupied at the time by families consisting of thirty-eight or forty individuals in all, none of whom, however, were ever in any degree affected. The village jail also, though an isolated building, as I have already termed it, in so far that its walls are not in immediate contact with any houses, is yet closely surrounded by them, at a distance of not more than twelve or fifteen feet on its north, east, and south sides; and its western face closes the upper part of a wide and very steep street. The situation of the building is thus elevated and exposed, and was known and proved to be altogether very healthy, for up to the time of its occupation by the second importation of infected strangers, part of the building of which it consists was used by the Board of Health, as a general soup-kitchen for the poor of the village, numbers of whom had in consequence daily visited it for several weeks previously with perfect impunity. Granting, however, that these various circumstances connected with the localization of the two houses, or rather of the two apartments of the village in which the cholera alone showed itself, are insufficient arguments against the local origin of the disease, and arguing still on the supposition, that its appearance in these houses was not in any degree owing to contagious effluvia generated in the bodies of the imported sick, is it not in the highest degree improbable to conceive, (as we must do in consonance with any other doctrine of its local origin;) 1. That throughout the whole village, and in the middle of a district of country of twelve or fourteen miles square, only two very circumscribed spots should have become, and become suddenly, the seat of elimination of a strong morbific agency or miasm? 2. That this morbific elimination occurred at precisely the very time at which the infected strangers happened to be brought to these spots? and, 3. That this local atmospheric or terrestrial morbific agency or miasm, thus strangely and suddenly generated, was so specifically and exactly constituted as to produce, and to produce only, the identical and very unusual form of disease under which the imported strangers were themselves labouring? Or further, throwing up entirely this line of reasoning with its chain of improbable assumptions, shall we be asked to assent to the convenient proposition, that the fact of the two nurses being attacked in preference to all the other inhabitants of the village and surrounding extensive district, was a matter of mere chance and coincidence? This last argument might indeed have, in despite of the positive nature of the evidence to the contrary, been allowed to possess some weight, if the case which I have mentioned had been a solitary one in the history of the spread of cholera; but the same fact of the disease in a new locality being at first imported by an individual or individuals coming from another locality in which the malady was already prevailing, and afterwards, first spreading from this infected individual or individuals to such of the *resident* inhabitants that had earliest and closest intercourse with them, has now been remarked over and over again in so many accumulated examples, wherever the march of the disease has been strictly and carefully watched, that it seems altogether idle and absurd to attempt to refer all such cases to accidental coincidence alone.

Before proceeding to cite a number of additional examples of the imported contagion of cholera, it may be well to premise here once for all, that the same negative arguments that we have used in regard to Bathgate, might (if such a repetition were necessary) be shown to apply to all the several individual cases we shall have occasion to mention, and to afford the same strong probability, in each instance, of the disease being communicated from the sick stranger to the healthy inhabitants of the new locality by the medium of contagion;—or, conversely, that the affection of the latter could not depend on any other general or local morbific agency. In arranging the cases, I shall bring forward, *first*, some examples in which the disease spread, as in Bathgate, to one or to a few only of those residents who had communication with the imported sick; and *secondly*, I shall state other instances in which the malady became to a greater or less extent disseminated over the general community from this first centre of imported contagion.

Dollar.—I am indebted to the kindness of Dr Walker for a very circumstantial account of all the facts connected with the appearance of cholera in Dollar. This village is situated in Clackmannanshire, and contains a population of about 1500. Out of all this number of resident inhabitants, only one was attacked with the epidemic cholera, and this person was taken ill after having slept with another individual who had come to her house from a distant and infected locality, when already actually labouring under the disease. The following are some of the principal circumstances relative to these two cases.

On Saturday, the 12th May 1832, —— Campbell, a young woman, who was residing at the Devon Iron Works, where the cholera had been raging extensively for several weeks, found herself extremely unwell, and suffering under the earlier symptoms of the prevailing disease. Afraid of being sent to the Cholera Hospital, she set out on the evening of that day for Dollar, (a distance of four or five miles), and took up her abode there with her mother, who lived by herself in a cottage in the village. Early on the ensuing morning, (Sunday,) some of the members of the Local Board of Health heard of the arrival of Campbell's daughter, and immediately requested a medical man to visit her. She was found by this gentleman to be in the collapsed stage of cholera. As soon as this became known in the village, a tumult ensued, and it was at last determined to send back the young woman in a vehicle to the Devon Iron Works' Hospital, where she died that night. At the same time her mother was placed in quarantine in a comfortable and commodious house, about a quarter or half a mile out of Dollar, that had been previously prepared as a temporary hospital for the reception of any cases that might occur among the residents of the parish. So jealous were the inhabitants of contagion, that a neighbour of the name of Patterson, whom they found in Campbell's house, but who had been there only for a few minutes, was also sent off to this temporary hospital, and confined in a separate apartment. After this removal of the inmates, Campbell's cottage was set on fire, and it, with every thing it contained, was consumed early on the Sunday forenoon.

On the morning of the following day, (Monday the 14th), Dr Walker, on visiting the hospital, found the old woman Campbell in apparently perfect health. During, however, the course of the same evening, she suddenly became very ill, and after some abundant rice water evacuations, speedily fell into a state of complete collapse, with violent spasms and excruciating pains in the extremities, and other well-marked symptoms of malignant cholera. She expired on the following morning (Tuesday 15th) after an illness of fourteen or fifteen hours. The surgeons of the village had been obliged to conduct the vehicle in which her daughter was driven back to the Devon Iron Works, and "so great," Dr Walker observes, "was the terror of the villagers on the old woman's death, that no one would assist at her interment. The undertaker left her coffin on the turnpike road near the hospital, and the medical gentlemen had to put the body into it, screw it down, and drive the cart which carried the corpse to the grave. The horse even was obliged to be procured from a stranger at an exorbitant price; and, (as if there were danger of the very *dead* becoming infected,) the victim of cholera was buried outside the village churchyard."

The woman Patterson, after having remained for several days in quarantine in perfect health, was allowed to return home.

The nearest point to Dollar at which the cholera had appeared previously to the occurrence of the cases of the two Campbells, was at the Devon Iron Works, a distance, as has been already remarked, of four miles. Some months afterwards, one or two suspicious cases were observed within the precincts of the parish, but none in the village itself—a fact which can only, as Dr Walker remarks in his communication to me, be considered as the more singular—if we regard the disease as epidemical, and not simply contagious—seeing that the inhabitants of Dollar must have been eminently susceptible of any general morbific influence on account of the fear of the malady that they manifested, and which is almost universally regarded as one of the strongest predisposing causes to it.

East Hagbourn.—Mr Prebble, of Harwell, has given an account of the introduction of cholera into East Hagbourn, a small village in Berkshire, between fifty and sixty miles from London, the circumstances of which are, in a similar way as the preceding cases, strongly illustrative of the importation of the disease into a healthy locality, by an infected person arriving in it from an infected place. In the instance recorded by Mr Prebble, a person who had contracted the premonitory symptoms of cholera in London, travelled, while labouring under them, to East Hagbourn, and there, after suffering under a well marked and violent attack of the disease, recovered. Two females who nursed him were soon afterwards attacked, and both died. No case of cholera had occurred before in that locality, and the disease did not spread further than these three cases. The following are the more circumstantial particulars relative to this isolated but important set of cases.

1. William Woodley, aged 23, went from East Hagbourn on Thursday, 22d March 1832, to London. He slept in London for the four following nights, in a street (Tooley Street,) in which cholera prevailed at the time. On Saturday the 24th, the second day of his residence in this locality, diarrhœa came on. On the fifth night (26th,) he slept in the neighbourhood of St Albans, and returned to East Hagbourn on Tuesday, 27th. Vomiting, with copious rice-coloured fluid evacuations, cramps, &c. supervened on Thursday, 29th. The cramps left him on the following day, but the diarrhœa continued until Monday the 2d of April. On Tuesday the 3d, he was quite convalescent.

2. Mary Woodley, aged 51, the mother and nurse of the above person, was, on Sunday 1st April, seized with violent cramps of the trunk and extremities, universal coldness, vomiting and purging, with rice-water evacuations, blueness of the skin, &c. She died in twenty-three hours.

3. Mary Winders, aged 70, nurse to the first case, had symptoms precisely similar to Mary Woodley, commencing on Thursday the 5th of April. She sank in fifteen hours and a-half.—(Lancet for 1831–32, Vol. ii. p. 62 and 125.*)

Carnwath.—In the parish of Carnwath, Lanarkshire, containing a population of about 5000 individuals, five cases of pestilential cholera were observed during the prevalence of the disease in this country in 1832–33, and the first of them was imported. Dr Wilson, who was chairman of the Local Board of Health, has favoured me with the following particulars relative to the history of these five cases.

The first instance of the disease was observed in the person of a stranger of the name of Waters. This man was a native of Beith in Ayrshire. He was travelling homewards to his native place, asking charity,—after having, a few days previously, left off his employment as a mason in the more eastern districts of the country where the cholera was raging. It was not ascertained from him at the time whether he had been directly exposed in the east to the contagion of cholera, but he was taken ill with the premonitory symptoms of the disease on the road, at some distance from Carnwath, and when he reached Braehead, (a village in that parish, containing about 150 inhabitants,) on the —th of June 1832, he was *already* labouring under a bowel complaint, and unable to proceed farther. He took up his quarters in Braehead, in a lodging-house, kept by a person of the name of Telford, and all his symptoms having speedily become more severe and characteristic of cholera, he was sent onwards in a cart by the alarmed villagers, into the adjoining parish of Carstairs. He died either that night or on the following morning.

---

* In a private letter with which I have been lately favoured by Mr Prebble, he states, that up to the present date no other instances of malignant cholera had ever been observed in East Hagbourn, or nearer it than Oxford, twelve miles off, with the exception of two suspicious cases that occurred at Milton, a village five miles distant. The first of the Milton cases was in a corn-dealer, who returned from London about the 12th March 1832, affected with diarrhœa and cramps of the lower extremities. He recovered without medical assistance. His wife, however, became ill on the 14th, with symptoms precisely similar to those of W. Woodley: (see above cases, No. 1.) She recovered after the attack had lasted ten days. In answer to an inquiry upon the subject, Mr Prebble informs me, that the diarrhœa in W. Woodley's case lasted from the 24th up to the time of decided cholera symptoms appearing on the 29th.

The day on which Waters was removed from the lodging-house in Braehead, one of Telford's (the lodging-house keeper) daughters, and Jean Gibson, cleaned the clothes of the house, and were both taken ill that evening. Gibson died within thirty hours with the most distinct symptoms of cholera; but the girl Telford recovered after a severe attack. At this time two hawkers (a man and his wife) came to Telford's. They both sickened with cholera. The woman recovered, but the man died after a few hours illness.

The Local Board of Health adopted every possible measure to prevent the spread of the disease. No other cases of cholera previously or subsequently occurred in Carnwath, or any where within a circuit of country of seven miles extent, at least, around it.

Glen.—This is a healthy little village, situated about two miles south of Falkirk, Stirlingshire; and inhabited by between thirty and forty families of colliers. In April 1832, eight cases of cholera occurred in it, the two first of which were in individuals who had been exposed to the contagion of the disease in another distant locality. My friend, Mr Graham of Polmont, who has the villagers under his professional charge, has furnished me with some interesting particulars regarding the history of the disease among them.

1. and 2. Robert Anderson, and his wife, after spending some nights at Airdrie, (about fourteen or fifteen miles distant,) in a house where some of their relations had died of cholera, returned from thence to Glen on Wednesday the 4th April. At the time of their arrival, both were labouring under the premonitory diarrhœa, and, as was afterwards confessed, they were themselves convinced that they had taken cholera. They kept their com plaints, however, as secret as possible, in consequence of the strong feelings of prejudice then existing regarding it, until Sunday the 8th, when Mr Graham was sent for by the overseer of the mines at the village. The woman was by that time collapsed, and died next night. Anderson himself had the charactéristic diarrhœa to a great extent; but, being of a strong constitution, he ultimately rallied after lying in a state of collapse for thirty-three hours. 3. and 4. Two of Anderson's children, who had remained at home while their parents were visiting the infected house of their rela-

tives in Airdrie, were seized with distinct, and, in one of them, severe symptoms of cholera on the 12th. They both recovered. 5. A man, named Benny, was suddenly taken ill with all the symptoms of cholera on the morning of the 10th. He was immediately subjected to active medical treatment, and recovered. 6. Jenckens, another man, was similarly attacked on the evening of the same day, and also did well. Mr Graham does not state what particular communication the two last persons, Benny and Jenckens, had with the Andersons. 7. A daughter of Jenckens, (No. 6) was attacked on the 11th; and the eighth and last case occurred on the 15th, in the person of Alexander Brown, who had gone repeatedly to look at Anderson's wife while she was dying.

Ferryden and Boddin.—The following facts with regard to the introduction of cholera into Ferryden and Boddin, two villages in Angus-shire, Scotland, have been drawn up by Dr Brewster, the brother of the distinguished Sir David Brewster, and clergyman of the parish in which Ferryden and Boddin are situated. I am indebted for the communication of them to Professor Alison.

The village of Ferryden is placed on the south bank of the South Esk, opposite to the town of Montrose, and contains about 700 inhabitants. The district of country in which it lies remained altogether free of cholera, when in 1832, and the earlier months of 1833, the disease was prevailing in different parts of the kingdom. In the end of June 1833, the smack Eagle, from London, arrived at Montrose. Two cases of cholera had occurred amongst the crew during the passage from London, one soon after the smack left that port, and the other off Harwich. As soon as the vessel reached Montrose river, the crew dispersed to their several homes. One of them, Robert Findlay, an inhabitant of Ferryden, carried his clothes and bedding to his house there. A day or two afterwards, two children in the village, who were reported to have been seen tumbling during the preceding day on Findlay's mattress as it was laid out to the air, were seized with rapidly fatal cholera, and died on the 2d of July; and this, it may be proper to remark, took place at a time when the disease was considered to have nearly or entirely disappeared from Scotland. On visiting Ferryden that day, Dr Brewster found the mother of the two children labouring under a fatal attack of cholera. The malady subsequently spread through the village, but not rapidly; and during the four weeks it continued, it carried off 27 out of the 700 inhabitants, or nearly 1 out of every 27 of the residents. It appeared (Dr Brewster observes in the communication with which I have been favoured) in different parts of the village in succession, and almost uniformly among the relatives, visitors, and neighbours of those who were previously affected. Out of the few cases, he adds, which appeared in Montrose, two were relatives of the sick in Ferryden, whom they had gone to visit there, and were themselves seized with the disease after their return home. The inhabitants of the adjoining district of country in general carefully avoided all communication with Ferryden, and the disease only appeared in one other part of the parish, viz. in Boddin, a small village on the sea coast, nearly three miles south from Ferryden. Only two cases occurred in this locality, but these two afforded strong corroborative testimony of the contagious property of cholera. Margaret Stott, a young woman, an inhabitant of Boddin, went to visit her sister at Ferryden, and, upon returning to Boddin, was seized with the disease, and died in two days. Jean Peterkin, an aged woman, who lived in the house adjoining to that of Stott, and who had not been out of the village, assisted, amongst other things, in putting Stott's body into the coffin, and afterwards washed her bedding. In the course of two or three days she had a fatal attack of cholera. No other person (Dr Brewster adds) in the village of Boddin, or in the parish, or in the surrounding district, with the exceptions now noticed, was affected by the disease.

Hutton.—Drs Keenlyside and Allardice have stated the following interesting particulars in regard to the first appearance of cholera in Hutton, an elevated and cleanly village in the county of Berwick.

A weaver, John Cooke, was the first person in the village who was attacked with the malignant cholera. This man had been visiting Newcastle, where, the reporters observe, it is a matter of notoriety that the cholera then prevailed. Previously to setting out on his return home he was under medical treatment in Newcastle for diarrhœa. He reached Hutton, a distance of forty or fifty miles, on the 2d October 1831, and within a few hours after his arrival, was in the collapsed stage of cholera. He died early on the following morning, his case being, I believe, the first instance of the malignant cholera that was observed in Berwickshire; and, as has been already remarked, he was already labouring under the premonitory stage of it *before* he left Newcastle. In the course of a few days after Cooke's death, the following persons resident in Hutton were attacked, viz. 1. A person who was much with Cooke before his death, and who had assisted in laying out his corpse. 2. The woman who washed his clothes; and, 3. Three of the family living in the house adjoining Cooke's on the one side, and four of the family inhabiting the house adjoining his on the other side were successively attacked and died. These three houses had a common yard or court, and all the other cases which followed were confined to the neighbourhood of them, with the exception of the woman that washed Cooke's clothes, and who, as has been already remarked, was the third person attacked in the place. This woman lived at Enterpen, a distinct and separate portion of the village, where she seemed to act as a new focus for spreading the contagion, as after her, her own son-in-law, and a young woman living in an adjoining house in the same part of the village, were attacked with the disease.

Drs Keenlyside and Allardice, add, "that no communication, or almost none, took place between the persons residing in the immediate neighbourhood of the disease and those at a little distance from it, except by the vicar and the two surgeons."—Medical Gazette, xi. 316.

Hawick.—Dr Douglas of Hawick, in Roxburghshire, has published in the Cholera Gazette, page 233—248, a very able and elaborate account of the first appearance of cholera in that town, which seems, in the same manner as the preceding cases, illustrative of the contagious importation and consecutive spread of the disease.

A cattle-dealer, belonging to Hawick, while attending the market of Morpeth, in Northumberland, fifty-five miles distant from Hawick, put up on the 10th and 11th of January 1832, at the same tavern with a commercial traveller from Newcastle. The traveller, who had been visiting during the three previous days several of the villages in the neighbourhood of Newcastle, where cholera was at that time prevailing, was seized on the 10th at the tavern in Morpeth, with confirmed symptoms of the disease, and died on the 11th. (See Dr Trotter's Report of this case in the Cholera Gazette, page 30.) On the same day the cattle-dealer left Morpeth to return home. When inquiry was made, after the decease of both parties, it could not be ascertained that the cattle-dealer had had any intercourse with the infected traveller, or had even seen him, the latter having remained only for a short time on the 10th in the travellers' common room; but it was found that the cattle-dealer had slept in the apartment immediately above that in which the sick traveller lay, and had occasion to pass close to his room door; and the person who officiated as nurse to the traveller performed the usual duties of chambermaid in the apartment of the cattle-dealer. Early on the 14th, the day after his return to Hawick, the cattle-dealer took well-marked cholera, and died on the 18th. On the 16th, his brother and son, who attended on him, were attacked. On the 22d, a female neighbour, who had been in personal communication with the family, was seized, as were subsequently her daughter on the 23d, and her husband on the 25th; and in the course of three or four weeks a gradual succession of 20 other cases occurred in the town, and in all of these some previous intercourse, direct or indirect, with the family of the cattle-dealer, or with those secondarily affected, could be traced, with, it is stated in the printed report, one exceptional instance, in which no known communication with infected persons or goods could be made out; but by a private letter which I have received from Dr Douglas, I am informed, that, after his report was published, he clearly made out a communication between this person also and the cattle-dealer's family. Dr Douglas, after having attended the cattle-dealer's family and others, was himself laid up with the disease on the 5th February, and one of his sisters, who attended him, had a very aggravated attack on the 7th. Another sister was seized with diarrhœa, and sickness at stomach. Previously to the case of the cattle-dealer, no instance of cholera had been observed anywhere near to Hawick.

Eight months and a half after this first irruption, the cholera broke out again at Hawick; but in this second attack it could not, I am informed by Dr Douglas, be traced to a contagious introduction, but broke out at one and the same moment in different parts of the town.

In each of the three instances which we have next to bring forward, the city of Glasgow formed the infected focus from which the contagion was carried.

Campbelton.—In this town, which contains between 9000 and 10,000 inhabitants, and is situated on the west coast of Argyleshire, there were two separate irruptions of cholera in 1832,—the first in April, and the second towards the latter end of July. During the first irruption, only thirteen cases occurred, ten of which were fatal; and, through the kindness of Dr Macdonald of Ballyshear, I have been favoured with some notes of them drawn up by Dr Macintyre of Greenock, who was, at the time mentioned, surgeon to the Cholera Hospital at Campbelton. The first case is remarkable on account of the length of the latent stage, and of the premonitory diarrhœa. 1. Archibald Witers, aged 28, went from Campbelton to Greenock and Glasgow early in April. He himself confessed, (as I am informed by Dr Macdonald, and the same, Dr Macintyre states, was admitted by Witers' mother,) that while in Glasgow he slept in a house where cholera existed. In returning home, he came by a steam-boat to Tarbert, and travelled from thence to Campbelton by land, (a distance of thirty-seven miles), without entering any house on the road. He reached home on the 10th April. On the 15th, he was attacked with diarrhœa, and by the morning of the 17th had also some nausea and vomiting. Dr Macintyre visited him at 4 o'clock P. M., on the latter of these days, (the 17th), and found him affected with all the characteristic symptoms of malignant cholera. On the 19th, however, he was convalescent, and had no consecutive fever. 2. Mary Morrison, aged 7, who had been in Witers' house when he was ill, was seized at 7 P. M., on the 20th, with decided cholera, and died in twenty-two hours. 3. Mrs Morrison, the mother of No. 2, was attacked with the disease at 6 A. M., on the 21st, and sunk in about twenty-one hours. 4. Mrs Witers, the mother of No. 1, who had attended and nursed her son during his illness, sickened in the afternoon of the 21st, of cholera, and died on the 22d. This last patient died in the Cholera Hospital. 5. Alexander Macneil, aged 70, residing in a street about 600 yards distant from that in which Witers and Morrison's houses were situated, was attacked with cholera symptoms on the forenoon of the 22d April. "He had," Dr Macintyre remarks, "been in conversation with one of the hospital attendants the night previous, and had been working, I believe, with Witers on the 15th and 16th, when the latter was suffering under diarrhœa." Macneil died on the morning of the 23d. 6. His wife, aged 70, was seized with the disease about 12 o'clock noon, on the 25th April, and died after an illness of thirteen hours. 7. A girl Sinclair, sister-in-law to one of the porters at the hospital, was taken ill on the 23d, but ultimately recovered. 8. Mrs Christie, aged 38, sickened on the morning of the 28th, and died on the 29th. 9. Her husband, Malcolm Christie, was attacked at 5 A. M., on the 29th, and died on the 30th. 10. Robert Wishart, residing in a house adjoining to that of Christie, was seized at 4 A. M., on the 30th, and died at 8 P. M. of that day. 11. Mrs Wishart, aged 35, wife of No. 10, was attacked the same day at 5 A. M., and died next morning. 12. Donald M'Killop took the disease on May 1st, and died on the succeeding day. 13. Fawcett, aged 4, living in the same house with the Wisharts, (Nos. 10 and 11), was attacked on the 3d, but recovered. Dr Macintyre does not state in the communication which has been put into my hands, whether or not any intercourse, direct or indirect, was traced between the Christies, Wisharts, and M'Killop, and those previously affected.

The 13 cases that have been mentioned all occurred within the space of eighteen or twenty days. After the last of them, (Fawcett's), on the 3d May, no other cases of cholera were seen in Campbelton till the 28th July, when the second irruption of the disease occurred, and between that date and the 28th October, 98 of the inhabitants were attacked with cholera. No importation of the disease in this second irruption could, as has happened often in regard to the subsequent returns or recurrences of the disease in other places, be distinctly ascertained.

Greenock.—Mr Turner, surgeon, Greenock, has kindly favoured me with the following facts relative to the first introduction of cholera into that town.

1. Dow, an elderly fishmonger, belonging to Greenock, went to Glasgow in the latter end of February 1832, and slept in that

city in a tenement in which cholera was at that time raging. Next day he came to Greenock labouring under a diarrhœa which, after continuing for two days, terminated in all the more marked and fatal symptoms of confirmed cholera, and the man speedily sunk. 2. Mrs Black, who officiated as nurse to Dow, took the disease next day, and also died. 3. On the following day Dow's wife was attacked, but recovered.

4. A fisher boy of the name of M'Millan, who was some hours in company with Dow, and drinking with him on the day he came from Glasgow, and when he was labouring under the premonitory diarrhœa, was seized with cholera that night, and died on the following one in the hospital. 5. Next day this boy's mother took the disease, and died in a few hours. 6. and 7. On the following day his father and brother had also a severe attack of cholera, but their cases did not prove fatal. The disease subsequently spread through Greenock to a considerable extent. The boy M'Millan had been out with his boat in the river, fishing, but with this exception, and that of Dow, who had been in the infected house in Glasgow, none of the other persons who have been mentioned had been for a considerable period out of Greenock, and the disease had not been previously seen in that town. In other words, Dow's nurse, and mother, M'Millan, his mother, father, and brother had only had intercourse with a previously infected locality, *indirectly* through the person or body of Dow, who had been, as already stated, exposed to the disease in his lodgings in Glasgow.

Doura.—At the small village of Doura, in Ayrshire, containing 37 families, and 170 inhabitants, not less than 21 cases of confirmed cholera appeared. The first case which occurred was in a young woman who had, on the 20th of February 1832, travelled on foot with her husband from Springbank, near Glasgow, where the disease was then raging, to Doura, a distance of about twenty or twenty-two miles. She was intending to proceed onward to Kilwinning, but she was seized with purging and vomiting on the road, and was so ill and exhausted by the time she reached Doura, that she could proceed no farther, and took up her abode in the village, in the house of an acquaintance. She expired the following evening, after having exhibited all the best marked symptoms of cholera, as recognized by the surgeon in attendance, who had seen the disease in India. The stranger was attended by two female villagers, (sisters,) who rubbed her, &c. One of these sisters was attacked with cholera on the 24th, and died after twelve hours illness. On the 25th, the other took the disease, but recovered. No restrictions whatever as to intercouse with the infected persons were put in force, and so rapidly did the disease spread, that by the 9th of March, 21 cases in all had occurred among the above-mentioned small population.

In this instance, as in several others which we have mentioned, a person travelling from an infected district, and actually labouring under symptoms of cholera, appeared to carry the disease through a line of healthy country to a distant locality. No case of cholera existed at the time anywhere near to Doura, and immediately previous to the arrival of this woman, the inhabitants were in the enjoyment in every respect of their usual state of health; yet, within the space of seventeen days after the infected stranger arrived among them, one out of every five individuals in the place was attacked with confirmed cholera,—six died of it,—and almost every inhabitant was affected in a greater or less degree with diarrhœa. (See Mr Salmon of Frome's Letter in the Lancet for 1832, p. 182, and also Mr Moir's Proofs of the Contagion of Malignant Cholera, p. 64.)

Dromore and Portaferry.—The first case of cholera in the town of Dromore, in the county of Down, was in a man who had been visiting Belfast, a distance of seventeen miles. While in Belfast he assisted a cholera patient into the vehicle employed in conveying the sick to the hospital. He then returned to Dromore, and within twenty-four hours died of cholera. 2. His daughter, who attended him in his last moments, contracted cholera herself, but recovered; she had not left home.—See Dr Macormac's Observations on Spasmodic Cholera, p. 7.

Dr Macormac also mentions, that the first case of the disease in Portaferry, in the same county, was that of a man who came sick from Liverpool by the steam-boat. He died in Portaferry. After his death, his brother, who was servant man to a gentleman in the place, performed some of the last offices to his remains. The gentleman took the disease, but recovered.

I have been favoured by Dr Edward Greenhow of North Shields with the following notes relative to the first importation of the disease into that town, and into the village of Earsden Square, by individuals coming from previously infected localities. I shall give the details in Dr Greenhow's own words.

North Shields.—" The first case of cholera which occurred in this place was in the person of a pauper named M'Gwin, who had been exercising his profession of begging at Sunderland, where the disease, as is well known, was then prevailing. On the 8th of December (1831,) he had slept in Sunderland in a common lodging-house, some of the inmates of which were at the time labouring under cholera. On the following day (9th) he returned to his own hovel at North Shields, and was attacked the same evening with diarrhœa. When I saw him on the 10th he was labouring under decided cholera, but he ultimately recovered from

the attack. 2. On the 13th, this man's wife was attacked with cholera, and died in twenty-three hours. 3. A remarkably stout healthy woman, named Thomasine Logan, who had been sent from the workhouse for the purpose of nursing M'Gwin and his wife, was seized with the disease, and died within thirty hours,—thus forming a perfect chain of evidence as to its first introduction and progress, for it speedily extended itself in the immediate vicinity of these persons' dwelling."

Earsden Square.—"Up to the 26th January 1832, the rural district in the neighbourhood of North Shields remained free of cholera, when a woman belonging to the village of Earsden Square, which is attached to the Hotspur Colliery, walked into North Shields, a distance of four miles, to make some purchases. She called at the house of a friend whom she found dying of cholera, and the same night, after having returned home, she was herself taken ill, and continued so on the following day. Her neighbours not suspecting the true nature of her malady, did not seek for medical aid, and were continually crowding into her room; and it was not until the succeeding day when she died, and when several of those who had been most constant in their attendance in her chamber were attacked in a similar manner, that the alarm was taken. The panic, however, was now universal; and I was requested by the coal-miners to visit the village, and there made such inquiries as satisfied me of the foregoing particulars."

My friend, Mr R. S. Hopper, President of the Royal Medical Society of Edinburgh, has communicated to me the following information regarding the history of the disease in the city of Durham and in Hartlepool.

Durham.—A vagrant was received into this town from the affected district of Houghton-le-Spring, and was attacked on the day of his arrival at Durham with distinct cholera. He was carried to the prepared cholera hospital, where he soon died. The only resident inhabitant of the city who was affected with the disease was a nurse who attended the first patient; she also died of it. Although there was much ordinary diarrhœa prevalent at the time in Durham, yet, I am assured by Mr Hopper, that the two preceding cases were the only instances of true malignant cholera observed in the city.

Hartlepool.—In the sea port town of Hartlepool, in the county of Durham, the history of the introduction of cholera, as stated to me by Mr Hopper on the authority of Dr Green of Durham, was peculiar, and interesting, as bearing upon the question of infection from the dead body.

One of the sailors on board a vessel, which a short time previously had left an infected port, was attacked with the disease, and died on board. The vessel happened to be then passing near the port of Hartlepool, and the body of the deceased sailor was sent on shore and left on the quay. Some dispute occurred as to what party ought to bury it, till at last a magistrate gave the necessary orders. No instance of cholera had up to that time been observed in Hartlepool; and the first inhabitants attacked with it were the porters who were hired to perform the necessary arrangements about the interment of the body, and who placed it in the coffin, and conveyed it to the churchyard. From this time the disease, Mr Hopper adds in the communication I have received from him, rapidly spread in the town, and chiefly in the vicinity of the persons first affected.

Warrington.—The history of the mode or modes of introduction of malignant cholera into the town of Warrington, in Lancashire, affords perhaps as strong possible data as any individual example could furnish of the contagious importation and propagation of the disease. The various circumstances connected with its appearance in that town have been very lucidly stated by Mr Glazebrook of Liverpool, who was secretary to the Warrington Board of Health, in a small but able pamphlet upon the subject, entitled " A Record of Events during the prevalence of Cholera at Warrington." It would indeed be fortunate for medical science if we possessed many more similarly clear, simple, and unassuming statements of facts in reference to the history of cholera and other epidemic diseases in different localities; and the whole essay can only be regarded as the more creditable to Mr Glazebrook, when we consider that he is not himself a member of the medical profession.

There were several different importations of cholera into Warrington.

1*st*, Baden, a bargeman from Winsford, (at that time an infected locality,) died with symptoms of cholera at Warrington on the 5th June; but the disease did not spread from him to any of the inhabitants.

2*d*, Twelve days subsequently to Baden's case, or on the evening of the 17th June, Thomas Cook, a flatman in one of the vessels belonging to the Mersey and Irwall Company, came from Manchester (where the epidemic had appeared) labouring under a severe diarrhœa, which had attacked him on board the vessel during the passage. Next morning, when medical assistance was called in, he was found affected with all the symptoms of malignant cholera, and died on the 21st. On the succeeding day (the 22d) the first case of the disease in a resident, who had not been out of Warrington, proved fatal. This case occurred in the person of Mary Millar, the mother-in-law of Cook, who had acted as nurse to him during his illness. The disease was not observed to spread further from this source. But, *3d*, A new, and, as it afterwards proved, a more effectual importation of the disease took place about the same time in the persons of Elizabeth Miles, a woman of about thirty years of age, and her child, a boy about seven months old. This woman came from Manchester, where her husband had been attacked with cholèra on the 16th instant. He died on the 17th, and was buried on the 18th. That same day she left Manchester, and walked with her child to Warrington, a distance of about eighteen miles. On her arrival at Warrington in the evening, she was attacked in the market-place with evident symptoms of cholera, and was taken first to a house appointed for the purpose of lodging such persons as were conveyed by passport through the town, and afterwards removed to the hospital. She recovered after a severe illness. A woman, Brown, who attended Miles at the pass-house, was seized the next day, and died in fourteen hours ; and a second nurse, Ann Leigh, who waited upon her after her removal to the hospital, also took the disease and died on the 22d.

The child James Miles, who had been carried by his mother from Manchester, was taken to the Warrington workhouse when his mother was removed to the hospital, and was there attacked with cholera on the 20th, and died on the 23d. Immediately afterwards, the disease spread among the inmates of the workhouse,—the orders issued to keep the child separate, having, (as I am assured in a private communication from Mr Glazebrook,) been disregarded in a very great degree. Eighteen in all of the workhouse inmates died, including the governess.

4th, Another importation of cholera into Warrington occurred on the 23d, the day on which the child Miles died. On that day, Philip Inghram, a travelling vender of medicines, arrived from Manchester with his wife and family, and took up his abode in a house belonging to a person of the name of Lawless, in Bank Street. The following morning, one of Inghram's children was attacked with cholera, and died on the 28th of the consecutive fever. On the 26th, Inghram himself was seized ; at noon he fell suddenly into a state of collapse, and died at midnight. The house in which the Inghrams were lodged was remarkable for its cleanliness ; but on the 24th, Jane Lawless, one of the landlord's family, was taken ill with cholera, and others of the inmates were subsequently attacked. From this family the disease spread to the neighbourhood, progressing, as Mr Glazebrook has expressed it, almost by house-row. By the Lawless's family it was communicated to the Thomasons, four of whom died. The Bates and Longshaws, neighbours and friends, were the next victims. All endeavours to restrict intercourse were useless ; and the whole of Bank Street became so infected that 44 of its inhabitants were carried off.

But the mischief, Mr Glazebrook adds, did not end here. The sufferers were not only visited by their immediate neighbours, but by their relations and friends from a distance, by whom also their funerals were attended when the cases proved fatal. By such means the contagion appeared to be disseminated in different parts of the town and country, the disease consecutively attacking the friends, attendants, or relations of those who had fallen victims to it. For example, ten persons of the name of Lawless, all relations, and residing in five different streets in the town, were attacked, and only four of them recovered.

In all, 328 cases of cholera appeared in Warrington, out of a population of several thousands, and 169 of these proved fatal.

Dr Kendrick of Warrington, in a small tract which he published on cholera, has mentioned one case which illustrates well the observation made by Mr Glazebrook, of the disease having been conveyed from Warrington to some parts in the surrounding country by the friends of those who died in the town.

James Longshaw, aged 40, was seized in Warrington on June the 26th with cholera, and died on the 27th. His widow and three children removed immediately after the funeral from their residence in Lower Bank Street, to the house of a near relation at Lymm, and there, though themselves unaffected, appeared to communicate the diseases to their two relatives, Peter and Hannah Longshaw, both of whom in a short time died of cholera. No third case had been observed in the parish of Lymm at the date of Dr Kendrick's pamphlet two months afterwards.

Prestonpans.—In this village, which is situated in East Lothian, about eight miles eastward of Edinburgh, cholera raged severely for some time in the beginning of 1832. The first of its victims was a man of the name of Renton. This individual had spent the 15th of January at Tranent, where the disease at that time prevailed; and though usually sober, he had, in accordance with the too common custom in Scotland at that season of the year, (Old Handsel Monday,) passed the day in dissipation and intemperance. He came on the following day (the 16th) to Prestongrange (or Cuthill,) an outskirt of Prestonpans, bringing with him a child, who, two days after his return from Tranent, was seized with diarrhœa. Renton himself was attacked with malignant cholera, and died of it on the 20th. On the afternoon of the day on which he died, two persons, the son and daughter of a Mrs Allan, the latter of whom had been engaged in attending upon Renton, and employed in rubbing him, were attacked with the disease; and during the same evening, Renton's child, who had accompanied him from Tranent, was seized by it in its most malignant form, and died on the following day. During this latter day, (Sunday 21st,) Robert Smith, (whose house was nearly opposite to Renton's, with only a distance of about ten yards between them,) was attacked; and on the 23d, his wife, who had visited Renton twice during his illness, was also seized with the disease. Two others in this family became subsequently affected. (J. Eckford's Facts, &c. regarding Epidemic Cholera in Prestonpans and its vicinity, p. 15 and 17.) The disease afterwards spread through the village of Prestonpans, so that amongst its population of 2000 inhabitants, 117 cases occurred, and 21 of these proved fatal.

Cockenzie.—Mary Buchan, who lived at Cuthill, next door to one of the persons above alluded to as affected with cholera, left that place on the evening on the 24th January, and went to her mother's house in the village of Cockenzie, situated about two miles distant along the coast in the parish of Tranent. She was taken ill of cholera next morning. Her mother and stepfather were also seized some days afterwards, but all the three recovered. (See Report by Mr Cadell, Secretary to the Tranent Board of Health, in Mr Moir's able work on the Contagion of Cholera, p. 44.)

Edinburgh.—Before cholera reached Edinburgh, it raged for some time previously in a severe degree in the district of country lying to the east of the city, as in Haddington, Tranent, Prestonpans, &c. and particularly in the town of Musselburgh, six miles distant. The first cases of the disease which were observed in Edinburgh occurred towards the latter end of January 1832, and were all in the persons of individuals who had been visiting some of the places to the eastward where the cholera was prevailing, and who had consequently been directly exposed to the morbific cause or causes of the malady (whatever we allow these to be) which were operating in these infected localities. The second case (27th January) afforded an instructive example of the great difficulty which is often experienced in endeavouring to arrive at the truth in such investigations as the present. The subject of the case, an Irishwoman, residing in a close off the West Bow, was taken to one of the cholera hospitals, and was for some time conceived to afford the strongest possible evidence against the doctrine of contagion, for she stoutly denied having been out of Edinburgh. During the period of her convalescence, however, she voluntarily mentioned to Dr Ransford, then clerk to the hospital, that she had been some days previously singing in the streets of Haddington, Tranent, and Musselburgh, and had slept at Prestonpans in the bed of a cholera patient; and she stated that she had been before deterred from making this confession, under the dread that she would be punished for bringing the disease into the town.

None of the three first cases of importation of cholera into the city proved effectual in propagating it to any of the resident inhabitants; and no instance of a person being attacked with the malady, who had not been in the infected eastern districts, occurred till Saturday, the 28th of January, when a woman, widow MacMillan, died of it in Skinner's Close, High Street, after nursing her grandson, who was previously ill of the disease, and had been exposed to its contagion by residing in a house in Musselburgh, in which several fatal cases took place. Professor Alison has been so kind as draw up for me the history of these two cases, in as far as they bear upon the question of imported contagion; and I shall here give the communication with which he has favoured me in his own words, and with his own excellent prefatory remarks and comments.

" It seems to me clear," he observes, " that the evidence of the contagious nature of any disease turns ultimately on a calculation of chances. The question always comes to this,—Is the circumstance of intercourse with the sick followed by the appearance of the disease, in a proportion of cases so much greater than any other circumstance common to any portion of the inhabitants of the place under observation, as to make it inconceivable that the succession of cases occurring in persons having that intercourse should have been the result of chance. If so, the inference is unavoidable, that that intercourse must have acted as a cause of the disease. All observations which do not bear strictly on that point are irrelevant, and in the case of an epidemic *first* appearing in a town or district, a succession of two cases is sometimes sufficient to furnish evidence, which, on the principle I have stated, is nearly irresistible.

" For example, in the case of Widow MacMillan, in Skinner's Close, it is certain, as the whole town was under medical serveillance at the time, and every one on the watch for cases of even suspicious cholera, that she was the *first* person in Edinburgh or Leith (*i. e.* in about 160,000 people) who took the disease without having been in the district at Musselburgh, Tranent, &c. where it prevailed; nor was there any case in Edinburgh or Leith in a person who had not left the town for ten days after. And in regard to this first case of the disease in Mrs MacMillan originating in Edinburgh, the following points were ascertained by a judicial inquiry or precognition made, at the request of the Board of Health, by the Sheriff of the county, who examined different witnesses on each point till he was perfectly satisfied of its truth. 1*st*, That the woman herself had never been out of the Close in which she lived, during the existence of the disease in the neighbourhood. 2*d*, That her son, a hawker, had slept in a house in Musselburgh, in which a woman was dying of the cholera, on the Monday. 3*d*, That after returning to town, he was seized on Wednesday with vomiting and purging of whitish or watery matter, cramps, and feeble pulse. I saw this lad myself on that day, and immediately suspected that he had been at Musselburgh, which was at the time denied, but afterwards admitted, and confirmed by abundant other evidence. *4th*, That Mrs MacMillan was with him during the day, in a small confined room, rubbing his limbs and nursing him, and he recovered under the use of opiates and stimulants. *5th*, That on the Saturday, when he was convalescent, she was seized with the disease in its most virulent and unequivocal form, and died in ten hours. Now I presume it will not be denied that the epidemic cholera, which was never known in Edinburgh before 1832, and has not been seen in it since 1833, must have some cause or causes of local and temporary existence only. That the lad MacMillan, who had slept a night at Musselburgh, (then much affected with the disease,) should be seized with it, proves nothing as to the question, whether intercourse with the sick has the power of exciting the disease or not. But if that intercourse has no such power, it is plain that his mother, who never left her own Close, had no more business to take the disease than any other of the inhabitants of Edinburgh or Leith, and her infection must have been a mere chance. The chances, therefore, are nearly 160,000 to 1 against her being the first person in Edinburgh or Leith who should take the disease, and almost infinite to one against her being infected by it within sixty hours after her son.

" From the time, therefore," Dr Alison adds, "when I was satisfied as to these facts, I have never doubted of the disease having a contagious property, although I have never thought it proved that its extension is to be ascribed to that property alone."

In many of the more isolated cases which occurred during the prevalence of cholera in Edinburgh, the evidence of previous exposure to the infected could not be distinctly ascertained.—(See on this subject Dr Craigie's able monograph upon the disease in this city, in the Edinburgh Medical Journal, Vol. xxxix., p. 366, &c.)

The various cases or sets of cases which I have collected together in the preceding pages are all taken from localities in our own country. To show, however, that the same fact of the occasional contagious importation and subsequent propagation of cholera in previously healthy localities, by infected individuals coming from a sick district, has been observed in other parts of Europe, I shall select, from amongst a number of analogous cases which I might bring forward, a few illustrative examples from the history of the disease in France, and from the Russian Reports.

Saint-Tulle.—M. Robert, in an account of the cholera at Marseilles, in 1834–35, published in the Gazette Medicale of Paris for the 4th July of the latter year, mentions, that in several instances the people who, during the visitation of the disease fled and travelled from that city into the neighbouring villages, died in them without propagating the disease. He adds, however, one strong exceptional case. Andrew Coutel, after having spent six hours in Marseilles on the 28th of February 1835, was laid up two days afterwards (2d March) with a fatal attack of cholera, at his home, at Saint-Tulle, (Basses Alpes,) which is twelve leagues distant from Marseilles; and he communicated the disease to his wife, who also fell a victim to it. The local authorities, in the dread of contagion, burned all the effects which Coutel and his wife had made use of during their illness, and the malady did not spread.

Lisle.—In the Journal Hebdomadaire de Medecine, for September 1832, M. Brault has detailed minutely the particulars connected with the following still more decided cases of the contagious importation of cholera, into the village of Lisle, on the Loire. Pierre Poilpret lived at the extremity of one of the Faubourgs of Vendome, that had been afflicted with cholera for five weeks, when, on the morning of the 6th July 1832, he left home in charge of a public vehicle, and shortly *before* arriving at the village of Lisle, (distant about two leagues from Vendome,) he was seized with symptoms of cholera. He was put to bed in a tavern in the village, and died there in twenty-four hours. Up to this time the community of Lisle had remained entirely free from cholera. A woman, a resident of the place, who was perfectly fearless of the disease, and in good health, most assiduously nursed Poilpret during his illness, placed his body in a shroud, and remained beside his corpse for above a day after death. On the second day after the interment of Poilpret, this woman was suddenly seized about noon with the premonitory symptoms of cholera, and on the following day fell into a state of collapse, but ultimately recovered. On the 14th, a widow, who occupied a room, separated only by a thin partition from that in which Poilpret died, was seized with the first symptoms of cholera, and sunk under the disease on the second day afterwards. Her daughter, a servant at Monce, a quarter of a league distant, came and attended her during the last part of her illness. The daughter returned to Monce affected with a diarrhœa, which, on the 22d, lapsed into decided cholera, from which she recovered after a tedious struggle. A woman, an inhabitant of Lisle, who had made frequent visits, during their sickness, both to Poilpret's nurse and to the second villager whom we have mentioned as attacked, and who had shrouded the latter, was seized with diarrhœa on the morning of the 22d. The distinct symptoms of cholera soon set in, and the disease, after running its course, is reported as having terminated in recovery by the 2d of August.

Pensa.—From the accounts of the progress of the cholera in Russia, where the disease was so accurately observed, we shall subjoin only two cases,—the first of them containing the history of the introduction of the malady into a village, in the government of Pensa, as detailed by Sir William Russell (on what he believes to be sufficiently credible authority), in one of his letters from St Petersburgh:—[See Edinburgh Medical and Surgical Journal for February 1832, Supplemental Number, pages 173–4.] The son of an inhabitant of the village, who was coachman to a nobleman, at fifty versts distance, died of cholera. The father went to the place to collect the effects of his son, and brought home with him his clothes, which he put on and wore for a day or two after his arrival in his native village. He was shortly after seized with cholera, and died of it. Three women who had watched him in sickness, and washed his body after death, were also seized, and died of the disease. The common street of the village was then barricaded on that side which the disease had not reached, and all intercourse interdicted with the infected side. In that side of the village where the disease first broke out, upwards of 100 cases of cholera occurred, and of these 45 died, while on the other side, which had been barricaded, no case was observed.

Iletsk.—We select the following case from the official Russian Reports, as affording a remarkable instance of the transportation of cholera by exposed and infected individuals over a wide tract of country to a distant locality, while all the intervening district remained for the time totally unaffected:—In the fortress of Iletsk, in the government of Orenburg, the first cases of cholera, which were observed on the 2d of October, occurred in a soldier and a woman, who were taken ill of the disease while returning together from the city of Orenburg, (forty-two miles distant), in which the cholera was at that time raging. The intermediate line of country between Orenburg and Iletsk was still unaffected. The soldier and woman before leaving Orenburg had been in company with a man affected with cholera, and they both died of the disease on the day after their arrival at Iletsk. The malady soon spread to other persons in the garrison, and Dr Schimanski, the Staff-Physician, traced out very distinctly the progress of the disease throughout the first eight cases. The two first victims, the woman and soldier, contracted, as I have just stated, the disease in Orenburg. The husband of the woman was seized three days after her; about the same time two girls, who lived in the immediate neighbourhood of her male travelling companion and fellow victim, and who had visited him soon after his arrival at Iletsk, were attacked The aunt of these two girls, who nursed them, next suffered; and from her it spread to her two sons. The disease subsequently became diffused with such rapidity, that in the course of twenty days 113 persons had been attacked.—[Edinburgh Medical Journal, l. c. p. 49.]

In the official medical report upon the cholera in the government of Orenburg, which mentions the above case of Iletsk, it is stated, that in the same province alone, *eight* similar instances had been ascertained judicially, and by physicians who were attending the course of the epidemic, in all of which a person, who had contracted a tendency to the disease in a place where it prevailed, arrived in an uninfected locality, and there sickened and communicated a morbific condition to the atmosphere of his new residence.

SERIES II.

CASES OF IMPORTATION OF THE CONTAGION FROM AN INFECTED TO A HEALTHY PART OF THE SAME CITY.

The examples which I have hitherto mentioned, as illustrative of the direct importation and propagation of cholera, have in general referred either to villages and small communities, in which the first cases and subsequent dissemination of the disease can in general, it is evident, be much more accurately attended to and followed out than in large cities, or to the instances of those large towns in which the examples of the disease which first occurred were very marked in their character, and during the first period of its prevalence comparatively few in number. In a large city, the first cases of cholera are much more liable, than in a small community, to escape detection, or to be concealed from private or public politic purposes. The disease also is much more likely to be imported into such a place by several different channels at, or nearly at the same time; and after the affection has once begun to spread, it must, from the constant and great intercourse of society carried on in every large community, be extremely difficult, if not, in most instances, impossible, to trace out the particular source or sources of infection in individual cases; and accordingly it is among the medical men who have seen cholera in large, and particularly in commercial cities, that the doctrine of non-contagion has found some of its principal supporters. In several very well marked instances, however, the contagious propagation of cholera has been accurately traced even in large towns and cities through many series of cases, and several striking examples have been put upon record in which the disease was observed to spread itself among the inhabitants of a previously healthy house or street, when they had been exposed to its contagion by an individual sickening amongst them, who had caught the infection in another and distant part of the town, or who was already, at the time of his arrival, labouring under the disease in consequence of such exposure.

An interesting series of cases of this kind, strongly illustrative of the propagation of cholera by contagion in the heart of London, has been published by Mr Tweedie in the tenth volume of the London Medical Gazette, p. 113.

Half-Moon Street, London.—A basket-woman was taken ill with symptoms of cholera whilst selling fruit in the street, and betook herself to her own house in Sun Street, Bishopgate. Her sister-in-law called upon her, and had her removed to her house in Half-Moon Street, the disease not having hitherto shown itself in that vicinity. The patient was placed in the bed of one of her nephews, but was subsequently removed to that of her brother and his wife. As the night advanced another change was adopted, and a temporary bed was erected before the fire for the invalid. Her nephew and brother retired to their own beds, the sheets of which *were not changed*; and the sister-in-law remained in attendance as nurse. Next morning the woman was taken to the Cholera Hospital. On the following day the nephew, in whose bed she was originally placed, and his father were seized with cholera, and died. During the two subsequent days, two of the daughters of the family were attacked. and one died; and the mother had the premonitory symptoms.

Here we have one case of cholera imported, and five cases occurring in the same room, to which the patient was brought, in a street where no previous cases of cholera had occurred. The room in which these cases occurred was (we are informed by Mr Tweedie) situated on the *second* floor of the house, a part on which it would have been extraordinary for either terrestrial or atmospherical miasmata to have made their first attack, and that too, exactly at the time at which a case of cholera happened to be imported into the place. Some days, after a neighbour, residing in this same house, who compassionately lodged the mother and the remainder of the family in her own room, was seized with cholera, and died a martyr (as Mr Tweedie remarks) to the doctrine of non-contagion.

Simpson's Court, Edinburgh.—In the communication which I have already mentioned as having been sent to me by Dr Alison, that gentleman mentions the history of the disease in Simpson's Court, Potterrow, Edinburgh, about May 1832, which I shall here quote as corroborative of the present point of evidence of the occasional importation of cholera from one point of an infected city into another. The court alluded to is small, and contains only three or four houses with several families in each. "The first person affected in it," Dr Alison observes, "was an old woman; the next her husband, then others of that family, then neighbours, then friends who visited these families, until in all there had been ten cases, and I believe eight deaths of persons who lived in or visited that court. As the disease was comparatively rare in that neighbourhood, this plainly implied that a local cause was acting at that time in that court, and of this the remaining inhabitants were so convinced, that, with one exception, they left the place, and entered the Quarantine House at Fountain Bridge. But whether this local cause was an 'atmospheric influence,' or was the circumstance of intercourse with persons already affected with the disease, could not be judged merely from observing the succession there. I was, however, afterwards assured, that the first woman affected in this court had previously had intercourse with the disease, having been employed washing the clothes of persons affected, or who had died of it at the Water of Leith. This was ascertained by Dr Macdonald in Wharton Place, who then acted as medical inspector of that district, and this being so, I think a calculation of chances will show, that if the disease have no contagious property, the chance of that very unusual succession of cases, occurring among a small number of persons (for the ten cases occurred in a number not exceeding thirty who lived in or visited the court at that time) immediately after the intercourse with the disease in the person first affected, must be so exceedingly small, as to make the importation of the disease from the Water of Leith into that court almost a matter of certainty."

Regent Street, Glasgow.—Dr Arthur has furnished the following instance, from amongst the earliest cases of cholera in Glasgow, showing the transportation of the contagion of the disease from one part of that city to another, by an exposed individual.

Mr Macindee, of West Regent Street, gave one of his female servants leave to visit her mother at Springbank, on Saturday the 18th of February 1832. The mother was labouring under cholera. The daughter remained with her on Saturday and Sunday. On Monday she returned to her master's house in Regent Street, and was slightly indisposed on going to bed. At 4 P. M. on Tuesday the 21st, she was seized with vomiting and diarrhœa, became collapsed about nine that evening, and, after some reaction, died on the morning of Thursday the 23d. 2. The nurse who attended this servant was seized with cholera nine hours after having taken charge of her, and died after an attack of twelve hours' duration. This nurse, it is proper to observe, was brought from the cholera hospital to attend the servant; but she had been nowhere exposed to any local cause of the disease except within the hospital, and during her attendance on the servant in Mr Macindee's house.—See p. 161 of Cholera Gazette.

Back Spear Street, Manchester.—Dr Gaulter, in his account of "The Origin and Progress of the Malignant Cholera in Manchester," p. 67–69, and 171–6 and 8, has, among other examples similar to the preceding, recorded the following remarkable series of cases of the transportation of the disease from an infected to a healthy part of that city. James Falkner, a stout old man, began to show symptoms of cholera on Thursday, 21st June. His wife on the Monday following had one of those overwhelming attacks which come on in the form of fits; she died on Tuesday. On Wednesday, Elizabeth Nimmo, a relation by marriage, who resided at a considerable distance from Falkner's in Back Spear Street, a locality which was at the time free from the disease, went to assist in washing the dead body of Mrs Falkner. The day following she was seized at home with the disease, and died in four days. George

Nimmo, the husband of this woman, who lay by her side during the first night of her illness, was attacked the day after his wife, and survived her only two days; and a married daughter who lived with them had severe diarrhœa dating from the day of her father's death. In another apartment of the same house, on the same floor with the Nimmos, lived a family of the name of Barlow. When Mrs Nimmo was in a state of collapse, Mary Barlow, the mother, went into her room for a moment, and offered her the pipe she was smoking, which was refused. Barlow always declared that this was all the communication she ever had with Mary Nimmo during her illness, but there was reason to believe that she had seen George repeatedly. On the 3d July, the day after Mary Nimmo's death, Mrs Barlow suddenly fell ill, and died the next day; and a day or two after, her husband was taken ill with premonitory symptoms, which with great difficulty were prevented from running into collapse. At some distance from this second locality in which the man Barlow lived, and in a street likewise hitherto unvisited by the disease, lived Barlow's mother, Elizabeth Isaacs, with whom lodged Mary Walker. Isaacs put Barlow into the sling when she was carried to the hospital, and washed the sheets in which she had lain. Walker assisted her in both occupations. She afterwards accompanied Isaacs and her son-in-law to the dead-house of the Swan Street Hospital for the purpose of taking off Barlow's wedding ring. The incurvation and rigidity of the fingers made this an extremely difficult task, and it was not till they had been a long time immured there, and used the greatest efforts, that Walker at last succeeded in forcing it off. The second day after this exposure these women were seized at as nearly as possible the same moment of time, and both died.

To these cases, observed in Britain, we shall subjoin, as affording similar correlative evidence, one or two instances in which the same fact of the contagion of cholera being carried from an infected to a healthy part of the same city, was observed upon the continent of Europe. We shall select our cases from the three capitals of France, Prussia, and Russia.

Paris.—M. Velpeau, in an essay on the Cholera in Paris, contained in the twenty-ninth volume of the Archives Générales de Médécine, mentions several examples of the contagious propagation of the disease in that city; and we can only consider his testimony to the doctrine of contagion as the more impartial and valuable, seeing that he was one of those medical men who signed the celebrated official document, on the fourth day of the appearance of the malady in the French metropolis, denying altogether its contagious character. "Out of eighty and odd cases (he remarks, p. 224,) in this city, the history of which I have noted, there is none the subject of which had not some previous communication, direct or indirect, with other cholera patients." Among other series of cases he gives the following, (p. 222,) "A man, aged 55, had remained near two of his friends who were affected with cholera. He was attacked himself, three day afterwards, at his own house, (Rue Vieille du Temple,) and died in eight hours. 2. His eldest son, aged 23, who took charge of his father to the last moment, was attacked next morning, and died in seventeen hours. 3. The mother; 4. next the daughter; 5, then another son, who came from his work to the assistance of his sister, were successively attacked with the disease, but in a less severe form. 6. A child of ten years, who came to visit them, was also seized. 7. An artist living in the flat above was next affected; as well as 8. his wife; and 9. another person died of the disease in the same house, which, M. Velpeau adds, was not more insalubrious than the neighbouring habitations. The above persons were all (he likewise states) regular in their habits, and in comfortable circumstances.

In the surgical ward, St Jean, of the Hospital of La Pitiè, cholera (M. Velpeau again observes, p. 225) did not appear till after the nurse attached to it had been engaged in attending cholera patients in the medical wards. The first person attacked in the ward passed constantly by the bed of the second. The third occupied the bed nearest his, and the servant of the ward was next seized. A fifth, sixth, seventh, and finally an eighth case occurred among the persons lying in the beds nearest those attacked, 9. A young pupil, who, up till that time, had abstained from visiting cholera patients, came to the hospital in the morning. He was affected with cholera that night at *his own house;* and 10. his brother, who lodged in the same room with him, had a fatal attack of it on the following day.

Berlin.—Dr Becker, in his "Letter on the Cholera in Prussia," has given us several analogous examples observed in the city of Berlin. From these we select the two following instances:—

On the 5th of September 1831, a cholera dissection was performed in one of the streets near the river, which had been the seat of the first, and of numerous successive cases of the disease. Four young physicians who were present, not satisfied with the information derived from sight, touch, and smell, thought proper to ascertain the properties of the blood and contents of the intestines by tasting these fluids. One of these gentlemen, Dr C——, one of the loudest adversaries of contagion, before and since the appearance of cholera at Berlin, had for a fortnight laboured under diarrhœa, but continued his professional avocations. On the 7th, in the evening, he again attended a cholera patient. On the morning following, he was attacked with cholera, and died on the evening of the same day. He lived and died in a *part* of the city where, till then, no cholera had appeared. The landlord with whom he lodged, who, not feeling very well, had gone out to shoot a day before, heard of the melancholy event on returning home. He was seized with cholera, and died on the second day afterwards. Two of his children were also attacked, and died successively; and the servant maid was also taken ill, and sent to an hospital, where she recovered after a very severe attack of cholera. The landlord's widow, being now the only inhabitant of the house, was removed to a quarantine establishment. The house was purified, and no other case of cholera had happened in the same street at the date of Dr Becker's letter, three weeks afterwords. (P. 13.)

Some weeks ago, Dr Becker observes in another place, (p. 14,) a case of cholera occurred in the Dragoon Guards Hospital. A convalescent from fever, whom it was intended to dismiss very soon, was attacked with the disease. It seemed extremely difficult to account for the transmission of the contagion to this man, a patient in a military hospital, in which, and in the neighbourhood of which, there had as yet been no trace of cholera, and where every inmate was supposed to be under the most constant and strict observation. The inquiries instituted to discover the channels by which the contagion had reached this man led to no result. He was ordered to be removed to another hospital appropriated to the reception of cholera patients; and it was only when he was about to take leave of the medical officer who had treated him, that, thinking himself a dying man, he confessed having found means a few days before to go secretly to the house of his mother, who had died of cholera, and to take possession of some articles she had left. 2. The man lying in the hospital bed next to him was *also* seized with cholera, and likewise recovered. No more cases occurred in this hospital or its neighbourhood.

St Petersburg.—When the cholera invaded St Petersburg in 1831, the city prison, containing about 400 inmates, remained perfectly free of the disease until the 23d June O. S. when a prisoner, who had been sent out some weeks before to a public hospital to be treated for a syphilitic complaint, was returned back to the jail *with a diarrhœa upon her.* She saw and embraced her husband for a moment as she passed to the room of observation. In a few hours her symptoms became those of true cholera, and she died that night, forming the first case of the disease in the prison. The next persons attacked in the prison were three women placed in the same room with the first, and one of whom had rubbed the deceased. These three all died within three days after the first. The husband of No. 1 became next affected. He lived in a separate part of the jail. After this man, others in his room took the disease; and it extended itself ultimately to 27 of the inmates of the prison,—in all, 15 of whom died; and Drs Russell and Barry, who have reported the case on the authority of Dr Bish, the resident physician, state that there was but one out of these 27, to whom contagion could not at the time be traced. None of the noble class who were lodged in a separate part of the building were attacked.—See Edinburgh Journal for February 1832, p. 175.

SERIES III.

CASES OF THE IMPORTATION OF THE CONTAGION BY INFECTED SHIPS.

There is another species of positive evidence for the contagious propagation of cholera, nearly allied to, or indeed the same in its nature, as that which I have already endeavoured to illustrate; and as a most remarkable example of it, published sometime ago by Professor Dickson of Boston, (American Journal of Medical Science, No. xxvi. p. 359,) bears strongly upon the question of the importation and contagion of cholera, and the necessity of quarantine, I may perhaps be excused for briefly stating the particulars of the case.

But, in the first place, "let us imagine, (with Dr Dickson,) a government urged by its medical advisers, or disposed to decide a warmly contested dispute, were to select place and circumstance for a fair and guarded experiment by means of which to test the communicability of any form of pestilence: Could a better plan be suggested than that a vessel sailing from an infected city, and freighted with diseased subjects, should be stranded upon the shore of an almost barren and scarcely inhabited island, where her fated crew should be met by a deputation chosen from the several classes of the population of a healthy town at a safe and convenient distance. Let us suppose that most of the very few residents of the island were attacked with the malady thus imported, and previously unknown there, and that a considerable portion of those sent from the neighbouring town were also seized in the same manner, and that such only as had thus held intercourse with the vessel and her crew were throughout that whole region of country affected with the novel and well-marked disease alluded to. Would it now be acknowledged that all doubt was at an end, all further argument unnecessary, and the question settled for ever as to the possibility of importing and transmitting the pestilence experimented upon?"

The case published by Dr Dickson affords in itself precisely such an experiment as is here supposed, in reference to the importation and contagion of the malignant cholera.

Brig Amelia.—On the 19th October 1832, the Brig Amelia left New York (a city in which epidemic cholera at that time prevailed) for New Orleans. The Brig had on board her ordinary crew, and one-hundred and five passengers, some of whom had the disease *before* sailing; on the sixth day out, the sickness, according to the captain's subsequent official deposition, commenced in the vessel; and in the course of eight days more, or, in other words, by the 31st of October, twenty-four of the individuals on board had died of it, and several more were labouring under the disease. During the course of this last mentioned day (31st October) the vessel was stranded on the beach of Folly Island—a low and sandy island about twenty miles from Charlestown, and far out to seaward.

The island was the property of a Mr Milne, who kept four negroes upon it as permanent occupiers, and used it himself as an agreeable summer retreat. Mr Milne allowed the captain, passengers, and crew of the brig to take refuge in his buildings. The deputy port physician of Charlestown, Dr Elfe, was sent down to visit the island, and pronounced the disease which he found there to be cholera. A boat's crew of wreckers, who had gone down from Charlestown to the island to attempt to save the vessel and cargo, having returned to the city, one of the men belonging to the crew was there seized with well marked symptoms of malignant cholera and died. The rest of this boat's crew of wreckers were ordered back to the island to perform quarantine, and after having embarked two fell sick, and one died of cholera on their passage down. Two physicians, Dr Jewey and Pritchard, were sent to the island to afford the necessary assistance, and being worn out by constant exertions, they were relieved in the course of a week by a third medical officer, Dr Hunt. There were sent down also from Charlestown a clergyman, the man who had nursed the wrecker that died in the city, and a lieutenant and eighteen men of the city guard, the latter being ordered to the island to perform the duty of a *cordon sanataire,* and to prevent any individuals from leaving the spot. The wreck of the brig was burned on the 8th November. New cases, however, of cholera continued to occur up to the 17th; and it is important to remark, that some of those who were attacked had never visited the brig.

In this way there were collected upon Folly Island about one hundred and fifty individuals in all; and amongst these there occurred up to the 17th November twenty-three deaths, or sixteen per cent. of the number fell victims to cholera, including twelve of the passengers landed from the brig, six of the wreckers from Charlestown, (not reckoning the one who died in Charlestown and the other who died in the passage down,) three of Mr Milne's four negroes, the nurse and one of the city guard from Charlestown. Of the other seventeen men belonging to the city guard, and whom it was found impossible to prevent from communicating with the passengers dispersed over the island, every one was affected more or less with the symptoms of cholera, with the exception of the lieutenant; and nine of them were reported to have been attacked seriously. One of the three physicians Dr Hunt, was attacked on the 17th by the disease, but recovered.

The city of Charlestown escaped, and up to the date of Dr Dickson's communication, (an year subsequently,) no case of cholera had been seen in that town, except the one already alluded to as having occurred in the person of one of the wreckers.

It is but proper to mention, that, in a subsequent number of the American Journal, (No. xxviii. p. 377,) Dr Keckeley has inserted a paper, in which he endeavours to show that the cholera in Folly Island neither arose from contagion, nor was propagated by it. He does not deny any of the facts whatever stated by Dr Dickson, and, with the exception of no notice of Dr Hunt's own case, he gives the same returns in regard to the number of the crew, slaves, city guard, &c. who were affected and died. He even states, in addition to Dr Dickson's account, what I have already taken an opportunity of mentioning, that "some of the passengers had the disease before sailing." (P. 380.) Dr Keckeley attempts to explain the appearance of the disease upon the doctrine of what he terms "idio-miasma,"—"a variety of infection generated by the decomposition of the natural exhalations and excretions of the human body in a state either of health or disease, and always the result of inattention to cleanliness and ventilation." It attacked, he thinks, those on board the vessel on account of the length and tempestuousness of the voyage, and the consequent great confinement of the passengers, "their ill ventilation and filth,"—their "bad diet" and "mental anxiety,"—acting upon constitutions with predispositions laid to the disease in New York; while it seized again on the wreckers in consequence "of their exceedingly intemperate and dissolute habits, and their provoking the disease, by their inhaling the foul air of the brig." The one who first fell a victim to the malady had in addition "slept in wet clothes." With reference to the probable origin of the disease in the slaves, city guard, &c. and particularly in those "who did not visit the brig," Dr Keckeley states, that there is no difficulty in discovering why these persons became affected even although they did not visit the brig;" but contents himself on the subject by merely mentioning the anxiety manifested by all to leave the island, and by alluding to the further circumstances of the dead being "buried very slightly," and of the greater portion of those on the island being lodged there in tents, "and consequently exposed to the dampness and chilliness of the sea air, which is highly injurious in autumn." Lastly, Dr Keckeley further avers it as his opinion, that the fact of "only twenty-four passengers having died during the seven days of the disease at sea, is a strong argument against the existence of contagion." Certainly we conceive it to be altogether unnecessary on our part to reply to such extraordinary doctrines and reasonings as those here put in requisition by Dr Keckeley; and I will merely remark in regard to his paper, that it appears to furnish only stronger proof of the convincing nature of the case recorded by Dr Dickson, seeing that, among the great number of American non-contagionists, none should have attempted to explain away, on more rational and consistent grounds, the facts observed in Folly Island,—and that for this new case, a new and special etiological hypothesis was, under the sceptical views of the writer, found requisite to be formed.

If we met with an instance in which the crew of a vessel that had left an infected port, and had been immediately afterwards attacked with cholera at sea, happened, while the disease still prevailed on board, to arrive at a distant quarantine station, and there transfer some of its subjects that were at the time labouring under cholera to an hospital ship placed in this quarantine ground, and if the malady were subsequently to spread itself from

the transferred sick to some of those men belonging to this stationary ship who acted as nurses, it is evident that we would have a case, which, with the alteration of a fixed ship for a secluded island, was, in all its general bearings upon the question of the contagious communicability of cholera, similar to the history of the Amelia, as recorded by Professor Dickson. Such an instance occurred upon the coast of Scotland in March 1832.

*Smack Trusty.**—The Leith and London Smack Trusty arrived at London on the 19th of February, and after remaining in port for fourteen days, sailed again on the 4th March, with ten of a crew, including the captain and mate, and six passengers on board. In London the cholera was then prevailing to a considerable extent, more particularly on the side of the river, and in the quarter connected with the shipping. 1. On the morning of the 6th, the cook was attacked with cholera at sea, and died on the 7th. 2. Another seaman complained of headach when the vessel was brought up in Leith roads (a distance of about 400 miles from London) on the evening of the 8th. This man assisted on the same night another of the crew and a cabin boy to pull ashore the six passengers in the boat belonging to the smack. When he reached the harbour, however, he found himself so unwell as not to be able to return on board, and died of cholera next morning in the Leith Hospital at 12 o'clock. This was the second case of the disease observed in Leith, the first having occurred about a month previously in a man who had been visiting his infected relations at Musselburgh. 3. The other sailor who landed with him was also obliged to remain on shore, and had an attack of cholera that night but recovered. 4. On the morning of the 9th, another of the crew of the smack was seized with vomiting and purging immediately after the preventive boat visited the smack in the roads;—and the vessel having been ordered ten miles up the river to the quarantine station at St Margaret's Hope, he was, when the vessel arrived there about 5 o'clock of the same evening, transferred to the hospital ship Nymphe. The Nymphe (one of the old men-of-war employed as quarantine vessels in the station) had been previously cleared out as an hospital ship to receive a suspicious case of cholera which had occurred on board one of the vessels under quarantine on the 2d March, but this man had been discharged as well on the 5th. At the time that the sailor from the Trusty was placed in the

---

* The following case of the Trusty has been already imperfectly, and, in several respects, inaccurately stated in Mr Moir's Proofs of Contagion, p. 71; and in the Cholera Gazette, p. 264. To ascertain as accurately as possible every particular connected with it, I visited last summer the quarantine station, and had an opportunity of conversing with one of the nurses who was attacked, and with other persons officially employed there during the existence of the disease. I got access also, through the kindness of Dr Forsyth of Inverkeithing, the quarantine medical officer, to the quarantine official ship journals, in which the state of the sick, the arrival and release of all vessels, the condition of their crews, and all other correlative circumstances, were minutely entered twice a-day.

Nymphe, on the evening of the 9th March, the Nymphe had only two mariners left on board, who had volunteered to act as nurses. On the 11th two other mariners were joined to these, and on the 16th a fifth was added. The sailor from the Trusty had a severe attack, but continued in life till the 16th. 5. In the afternoon of the 10th a second sailor was transferred from the Trusty to the Nymphe labouring under cholera. He recovered. 6, 7. On the 11th two new men were attacked and sent to the Nymphe, both of whom died. One of them was a Leith porter, who had come on board the vessel in Leith Roads, having returned with the boats which landed the passengers. He and the pilot (who had joined the smack near the mouth of the river in Dunbar Bay) having been found on board by the officers in the preventive boat, were obliged to proceed with the vessel to the quarantine station. This porter, Murray, was cut off by the disease after an illness of only twelve hours duration. 8. On the 12th another of the crew of the Trusty was attacked and transferred to the Nymphe, but recovered in the course of a few days.

Thus out of the whole crew of the Trusty, ten in number, one died of cholera at sea; a second on shore at Leith; a third remained there, but recovered; a fourth, whose case proved afterwards fatal, sickened while the vessel lay in Leith Roads. Three others were attacked in St Margaret's Hope, and sent on board the Nymphe; and of these three, one recovered and two died. The porter who joined the vessel at Leith also took the disease there, and died. The three remaining members of the crew, and the pilot, who came on board in Dunbar Bay, had each an attack of diarrhœa.

Of the *five mariners* who acted as nurses to the crew of the Trusty on board the hospital ship, one was attacked with cholera during the afternoon of the 15th, and died in less than twelve hours. On the 24th, another of them was attacked with nausea, vomiting, purging, and tenesmus, but recovered. On the morning of the 27th a third is reported in the ship's journal as attacked with the premonitory symptoms of cholera, but is entered as better on the 28th and 29th. On the evening of the day on which the third nurse was attacked, a sailor was sent on board the Nymphe from a second infected vessel that had arrived in the quarantine ground, but up to that day only the men of the Trusty had, with the exception formerly noticed, been on board of her as patients.

Now in the case of the Trusty, if we suppose (as has been often done in regard to analogous instances) that her crew had been exposed to some local cause of the cholera (whatever we may admit that cause to be) in the port of London, it may be argued that the disease appeared in the members of the crew in the successive mode in which it showed itself, in consequence of the germs of the malady taking different periods to become ripened in the different constitutions of the subjects on board; and we are ready to grant that such an exposure as we here suppose, of the crew of the Trusty in London, may in this way explain the appearance of the disease among them, without necessarily involving us in the belief that the disease was at all attributable to contagion. But certainly it is altogether impossible to explain on this ground the infection of the porter from Leith, and the pilot from Newhaven, inasmuch as these men had not been in the infected locality of London, and did not come from infected towns in Scotland.

Again, it may be argued that the smack herself, or her cargo, contained some anomalous noxious matter, or miasm, capable of producing the cholera; and if we admit this, it will explain not only the infection of the crew themselves, but the infection also of the Leith porter and Newhaven pilot. This idea, indeed, was entertained by the captain of the smack himself at the time. He believed that there had been placed on board his vessel some dead cholera subjects for the Edinburgh dissecting rooms; and, at his urgent request, the Trusty was placed, on the 26th March, alongside the Duncan Lazarette to get her cargo, which was one of general merchandize, turned over on the deck of this latter ship. The Duncan was put under quarantine during the proceeding, but none of her men became infected by the exposed goods, and, it is scarcely necessary to add, that the suspicions of the captain of the Trusty were not verified.

But even admitting for a moment that the crew of the Trusty as well as the porter and pilot, were all infected by something noxious in the vessel or her cargo, this would still afford no reason whatever for the disease appearing in those *nurses* on board the Nymphe, with whom the sick crew of the Trusty were brought into contact. The Nymphe lay at about half a mile's distance from the Trusty; the nurses, (as I am assured by the second nurse who was attacked and survived, were never on board the Trusty,) and had no connection or communication whatever with *her* or *her cargo*, except through the medium of the *bodies* of her infected men; and we cannot conceive how their bodies could communicate the disease, except by acting as foci of contagion. It will perhaps be satisfactory in conclusion to remark, that there were many sail of vessels lying in the quarantine ground during the whole time around the Nymphe and Trusty, and yet the disease did not appear on board of any one of them except the Nymphe; and, I presume, simply for this reason, that none of them, except this ship, had any communication with the infected men of the Trusty.

GENERAL DEDUCTIONS AND REMARKS.

The cases that I have thus cited, (and these cases might easily, if it had been necessary, been greatly multiplied by reference to numerous recorded instances of a similar kind,) afford us, I think, sufficiently precise and ample data from which to draw the conclusion, that malignant or pestilential cholera *can* spread by contagion. That the disease does spread in all cases in this manner, is what the above species of evidence by no means empowers us to assert; and occasionally it has shown such eccentricities and anomalies in its course and general phenomena,—such sudden and simultaneous explosions at different points in the same locality, either upon its first introduction, or during some period of its prevalence, and such unexpected and inexplicable recurrences in places which it had already visited months or years previously, as are not easily, if at all reconcilable with any such exclusive doctrine of its mode of propagation. It must, however, be at the same time recollected, that if we once do admit the evidence of contagion to be complete in some instances, any evidence we may thereafter adduce of its not spreading by contagion in other instances (merely from the circumstance of our not being able to trace a chain of communication, either direct or indirect, between persons newly attacked, and those previously affected,) can be considered, in relation to our former admission, as only of a negative kind. In the one case, we have supposed positive evidence that the disease arose from contagion; and, in the other, we see a person attacked with cholera without our being able to discover any kind of intercourse between him and individuals previously affected,—we see the same specific effect, the same specific combination of morbid phenomena present themselves in the economy, without our being able to trace them to the same specific cause, and, in such an instance of causation, we may not perhaps unreasonably doubt whether the difficulty on our part, of tracing out fully the source of contagion, does not arise in many, or it may even possibly be in all cases, not from such a source of contagion being actually wanting, but merely from our want of success in discovering it.

Here, however, I would beg explicitly to state, that though thus arguing for the frequent, if not constant contagious propagation of malignant cholera, I by no means intend to maintain that the communication of the disease from individuals to individuals is not intimately determined, and in many instances very highly and extensively promoted by the collateral influence of other external agencies operating at the same time upon these exposed individuals, and by the existing degree of susceptibility of their bodies to the receipt and action of the contagious virus, according as that susceptibility is modified, both by these external agencies, and by the particular internal conditions of their own economies. The whole history of malignant cholera certainly goes to prove, that no variations in the external meteorological and physical agencies to which the human system has happened to be exposed, have been able to exert an influence sufficient at any time to suspend altogether the gradual progressive propagation, and onward march of the disease from India over the various inhabited regions of the world. The disease has shown itself in almost every kind of situation in which the human body itself seems capable of existing; in every variety of geological formation that is to be found upon the surface of the globe; in every kind of soil, from the marshy jungles and dry deserts of the East, to the most cultivated and fertile spots in Europe; it has prevailed thousands of miles inland, and along the shore; on continents, and in infected ships; in crowded cities, and in isolated hamlets; under the extreme heat of an Indian sun, and the extreme cold of a Russian winter. It has been observed to march forward in the very teeth of the monsoons, and has remained stationary while the atmosphere was passing over the seat of its devastations with almost the velocity of a hurricane. It stretched up the Nepaul and Himalaya mountains to places 4000 or even 5000 feet above the level of the ocean; and it raged severely along the banks of the Caspian Sea, which are nearly 300 feet below that level. It has accompanied human intercourse from house to house, from city to city, from country to country, and from continent to continent. It has travelled with man over seas, from sea port to sea port, from island to island, and has even followed him across the breadth of the Indian and Atlantic oceans.

But though thus no changes in situation, soil, climate, or season have appeared to stop the direct progress and propagation of cholera on the great scale, there are still, however, many facts calculated to show, that connected with these changes, or at least connected with some peculiar condition or conditions of the meteorological and common physical agencies that are continually operating on the body, or of the external morbific influences which exist around us, a peculiar general epidemic constitution is liable to prevail in certain localities, and at certain periods, which, by its collateral influence, tends to promote in a great degree the contagious diffusion of the disease, determining by its presence the particular severity of the malady in some localities, and by its absence rendering the contagion, when imported and inoculated into other new localities, comparatively innocuous in its effects, and limited in its power of propagation. In fact, we believe that some special but unknown epidemic constitution (say of the atmosphere or not) is necessary for the full spread of cholera, in any given place or season, as in India in the years 1817, 18, 19, 21, 25, 27, and 30, in the same way that we believe that special epidemic constitutions are necessary for the occasional full prevalence and spread of continued fever, of scarlatina, measles, small-pox, and other similar contagious maladies. In regard to several of these latter diseases, the proofs of the co-operation of such a cause for the complete action of their contagious virus, and for their consequent greater dissemination during some years than during others, seems to rest on the strongest possible evidence. Thus, for instance, let us consider for a moment the history of small-pox in this island in the latter half of the last century, and we take our illustration from this disease the more readily, because we presume that no one whatever at the present day doubts its strictly contagious character.

During that period, in consequence of the very general employment of variolous inoculation, the variolous contagion was almost constantly present in every town and village throughout these kingdoms; but it was still only at certain and distant periods that small-pox became so generally diffused among the population as to be reckoned *epidemic*. Looking at the phenomena of the dissemination of the disease on the great scale, we find, in fact, two great and remarkable distinctions in regard to the mode and capability of its propagation, or the degree of its contagiousness. *First*, it was seen at one time spreading easily and very universally among the predisposed, in consequence of slight intercourse with the infected; or, in other words, during the occasional prevalence of the particular epidemic constitution which is favourable to the dissemination of the disease, it was communicated from the sick to the healthy by contact, and by the medium of the contagious effluvia arising from the bodies of the former;—and *secondly*, it was found at other times, or during its non-epidemic seasons, to spread but rarely and sporadically, by mere intercourse alone, and to be propagated almost solely by direct inoculation of the matter of the pustules. With these two facts it is interesting to join a third, of the truth of which we have been assured by some competent observers, that during the blowing of the Harmattan winds upon the western coast of Africa, the natural small-pox is not observed to spread by contagion, and the disease can scarcely if at all be communicated even by direct inoculation.* Here then, in regard to small-pox, we have three different conditions of the external agencies surrounding the body,—or, if we choose to prefer the term, three different varieties of epidemic constitution, producing either three different degrees of infecting power in the contagious matter of the disease, or three different degrees of susceptibility in the human economy to receive the action of that contagious matter, or perhaps both; and facts of a similar nature might be easily adduced to show that a similar law holds good in regard to the propagation of cholera.

As to what may be the nature of the particular epidemic constitution which we here admit as a necessary coadjutant in the *full* spread and diffusion of cholera in any given locality;—whether it has been identically the same in essence wherever the disease has raged, from the Sunderbunds of Hindostan where it first originated, to the North of Russia, and on the continents of the old and of the new World;—or, as appears more probable, it is liable, if not to be changed in character, at least to be increased greatly in power and intensity by the varieties and circumstances of particular localities, (and these localities, sometimes extremely limited in their extent,) are etiological questions, the full examination of which would lead us into details much too extensive for the limits of the present essay. In regard to this subject, however, we may here remark, that as, on the one hand, in some of the cases which we have quoted in the preceding pages, we have seen localities, where the accessory influence of the epidemic constitution was *not* apparently present, once or oftener inoculated by imported cases with the contagion of cholera, without the disease spreading at all among the exposed resident inhabitants, or spreading only to one or two of them who happened to be either subjected to an intense dose of the contagious poison, or whose economies were at the time more than usually susceptible of its action;—so, on the other hand, it appears not an improbable view, (but one, indeed, which seems almost necessary to explain some phenomena in the history of the disease,) that in other cases a very strong and favourable condition of the epidemic or endemic constitution may occasionally produce the malady, by acting upon subjects whose bodies are particularly predisposed by previous morbid changes or otherwise, independently of the cooperation of the specific contagious virus.

---

* See on this last subject Norris in Philosophical Transactions for 1781, p. 53. Waterhouse in Haygarth's Sketch of a Plan to Exterminate Small-Pox, p. 277. Turner in Thomson's Account of the Varioloid Epidemic, p. 300.

The circumstance of cholera having occasionally attacked one or more persons in a new and sometimes very isolated locality, without a possibility of discovering any communication between these persons and those previously affected, has been strongly and justly insisted upon by the non-contagionists as altogether fatal to the doctrine, if not of occasional, at least of exclusive contagion. Without reverting again to the negative character of such evidence, as opposed to that more positive kind which we have endeavoured to adduce in the different series of cases which we have detailed, it may be reasonably replied to those who place too great weight upon this argument, that if it had all the force which many of those who urge it conceive, it would be also sufficient to destroy the fixed belief of medical men in the contagion of small-pox, and all analogous diseases, inasmuch as the same circumstance is often observed in regard to the appearance of small-pox, and these other diseases in new localities. For instance, not only does small-pox sometimes suddenly present itself in a house, village, or city, without our being able to make out any satisfactory chain of communication between those attacked and others previously labouring under the disease, but there are a number of cases on record where it has shown itself unexpectedly, in the inmates of prisons and hospitals who had not crossed the threshold of their respective abodes for weeks previously. Few, however, if any pathologists of note of the present day, would be inclined to grant that in any, and far less that in every such instance, in which a chain of contagious communication was thus not traced, that there was a *generatio de novo* of the small-pox virus ; and yet many of those who reject any such conclusion with regard to small-pox as hasty and illegitimate, would, upon precisely the same data, come to exactly an opposite opinion with regard to the bearing of similar cases upon the question of the contagion of cholera. The cases of cholera occurring without a probability of contagion, that were principally searched out and dwelt upon by non-contagionists in this country, consisted, as in those just alluded to, in the appearance of the disease among the secluded inmates of several of our public charities and institutions. But besides the individual sources of fallacy to which every such individual case may be liable, there is a general one to which we may here allude, consisting in the liability of the contagious poison to be indirectly carried to all such places by the persons of the medical officers who daily visit them, and who were, with very few exceptions indeed, during the progress of the late epidemic, taking at the very time every opportunity of observing the disease in other quarters, and thus rendering themselves moving foci of its contagion, ready to impart the disease to all the more susceptible individuals with whom they came in contact.

Again, it has been often urgently maintained, that if cholera were contagious, it would not, when once introduced into a town, be confined, as sometimes happens, to particular districts, streets, or houses in that town ; and also that all infected persons sickening with the disease in any previously healthy part of that place, or in any previously healthy village to which its infected inhabitants might escape, ought invariably to spread the malady to the other persons placed around them. If these arguments, however, were sufficient to cancel our belief in the contagion of cholera, they ought to be equally effectual in rendering us sceptical in regard to the contagion of small-pox; for the same phenomena have been observed in regard to the laws of propagation of this latter malady, and of other diseases of a similarly contagious character. If we possessed as accurate a history of any epidemic of small-pox, as we do of the late epidemic of cholera, and could refer to as many precise observations upon the phenomena of its local dissemination in particular places, we would, I believe, find the two diseases differing much less in this and in other points alluded to, than seems to be at all generally suspected. At present the medical literature of small-pox affords us very few data for instituting a complete comparison of this kind, but these data, so far as they go, are interesting and satisfactory. "I have known," says Dr Henry in a letter to Dr Haygarth, (Sketch of a plan to exterminate casual Small-pox, p. 309.) "the small-pox to be *strongly epidemic* in one part of Manchester, without any appearance of it in others, and this, notwithstanding that the variolous patients have resided in houses *adjacent* to the public ways, where numbers of children liable to the disease necessarily passed; and every practitioner," he observes, "must frequently recollect the small-pox to have afflicted the family of one house in a neighbourhood containing numerous families, several of the members of which were liable to infection, and yet have not received it. This, indeed," Dr Haygarth adds, p. 552, "is the true representation of *all* large towns, including the villages which surround them, nearly at all times." "At Frodsham," Dr Haygarth observes in another work, (Inquiry into the Nature of Small-pox, p. 95,) "the small-pox began in May, and gradually became more frequent, so as to be *remarkably* epidemic in *one* part of the town for several months, yet nearly one-half of the town still remained uninfected in November." "When the disease," he again remarks, (p. 94,) "was epidemic in Chester in 1777, many of the surrounding towns and villages were visited by it in one or more families. Yet the distemper did not spread generally through any one of these places." Dr James Sims, in his "Observations on Epidemical Disorders," made at Tyrone in Ireland, has a remarkable passage relative to the occasional non-infection, from imported cases of small-pox, of places containing abundance of susceptible inhabitants; and as the passage in question is not only strikingly illustrative of this point, but also bears strongly upon the remarks which we have already ventured to make upon the necessity of an epidemic constitution co-operating with contagion, for the full dissemination and prevalence of a contagious disease in any given locality, I shall take the liberty of quoting it.

"About the autumnal equinox, (Dr Sims states, p. 36,) bilious disorders declined, giving way to the small-pox, that with unheard of havoc desolated the close of this year, and the succeeding spring of 1767. They had appeared above a year before, along the eastern coast of the kingdom, and proceeded slowly westward, with so even a pace, that a curious person might with ease have computed the rate of their progress. In this they were scarcely to be interrupted, as appeared by the following instances. The children of soldiers on their march had brought them from other places to some towns here during the preceding summer, and although they were of a malignant kind, the afflicted all dying, and therefore most fit to propagate the infection, *yet not one of the inhabitants received them*, until in their regular progress they had travelled over the intermediate space. As they had not visited the country for some years, numberless subjects were grown up for them to exercise their fury upon, and many blooming infants were just opening to the sun in vain, since they were so soon to be cropt by this infecting spoiler ; and of thousands who caught the infection in this and the neighbouring counties, scarcely one-half escaped, and even of these, some with the loss of one or both eyes, and several with faces so altered, as to be known with difficulty by their most intimate acquaintances."

There is one argument which we hear constantly brought forward as supposed strong and conclusive evidence against the proof of the contagion of cholera and of other diseases, that is derivable from cases, or series of cases, similar to those that I have cited, and on this objection I would beg, in conclusion, to make one or two remarks.

It has been supposed that because *every* individual subjected to the contagion arising from the bodies of the sick was not attacked, therefore those who were attacked after being thus exposed could not be affected in consequence of this exposure. Thus, for example, in the instance of the village of Bathgate, (see Case I.) out of twelve persons, (four medical practitioners, one clergyman, four nurses, &c.) freely and repeatedly exposed to the infection, only two were affected with the disease in a well-marked and severe form, and one surgeon had diarrhœa and tormina. Now it has been maintained in relation to similar cases, that because the other nine individuals that had free intercourse with the sick were not affected,—those that were affected were not attacked in consequence of this same intercourse. But those writers and medical men who have ventured to reason in this manner, appear to have done so either in neglect or in ignorance of the first principles of medical etiology. They have forgot that before any exciting cause of disease, (whether contagious or miasmatic, whether consisting in the morbific agency of articles introduced into our body, or of the external agencies by which the economy is surrounded,) can act upon the animal system so as to produce disease in it, this system in general, or some individual part of it, must be previously altered from the standard of perfect health in such a way as to present that particular, but to us (as far at least as our diagnosis of its presence, or our knowledge of its intimate nature is concerned,) perfectly unknown state to which we give the name of *predisposition*. If no predisposition were required in order that exciting morbific causes could complete their action upon the body, then every individual exposed to the action of the exciting causes of any disease should be uniformly and invariably affected with that particular malady; every person living in a miasmatic country should be a martyr to ague at each return of spring and autumn; every soldier of an army that may have been exposed to wet and cold during a long day's march ought to be laid up at nightfall with an attack of pneumonia; and every inhabitant of the eastern coast of Britain ought to have an attack of hemicrania when exposed while the east wind is blowing. Nay, if the previous or concurrent action of some predisposing causes, or predisposing states of the constitution, were not required in order that the exciting causes of disease should produce their full effects upon the animal economy, then, I am afraid, almost the whole human race would continually be labouring under some forms or other of disease, as we are all, literally speaking, being constantly exposed to some one or other particular deleterious or morbific agency; and every fatal genral epidemic disease which has hitherto appeared ought, on this principle, to have utterly depopulated those localities which it happened to attack.

In endeavouring to set aside the communicability of cholera and other analogous affections from the sick to the healthy, by the fact of the non-infection of *all* those who are exposed, and in arguing, as has been sometimes done in relation to the present question, that every person who is subjected to the contagion ought, if the disease were actually contagious, uniformly to suffer an attack of it, (in accordance with the established law, that like causes always produce like effects,) it seems to have been very generally forgotten, that to insure in any instance this invariability of antecedence and consequence among physical, metaphysical, or vital phenomena, the circumstances under which the causes are applied must be at all times, in all necessary points, perfectly similar. From want of attention to this simple logical truth, well informed individuals, and even occasionally medical men themselves, have been led to doubt whether we have the same stable foundation for conducting our inquiries into the invariableness and immutability of the operations either of our curative means, or of the causes of disease upon the human economy, as we have for our investigations into the causal relations of facts in physical and metaphysical science. And certainly, though we cannot believe that the laws of causation, which regulate the actions of morbific and therapeutic agents upon the living economy,—or which preside over the vital operations, whether healthy or morbid, which occur in that economy,—differ in any degree from those that regulate the order of sequence among material and mental phenomena in general,—still we are ready to admit that the reality and stability of these laws, as applicable to the former branches of inquiry, may at times appear doubtful when we happen to loose sight of the difficulty of obtaining a sufficiently exact *sameness* of circumstances, either in two different individuals, or in the same individual at two different times, for the repetition and confirmation of any observations or experiments that we may have occasion to make. For it is evident that, from the delicacy, variety, and number of the individual and combined structures composing the human frame,—the complexity of all the processes and actions constantly carrying on within it,—and the continual reciprocal influence of the mind and body, and of the different corporeal organs and functions upon one another,—and amidst also the ever-varying conditions of the several functions and organs themselves, in relation both to their own physiological activity, and to the nature, degree, and extent of those deviations from the natural standard of perfect health, to which they are each so incessantly liable,—it must be extremely difficult to find, in any given number of persons, a perfect and exact similarity in all circumstances, and assuredly impossible to recognize such a similarity even when it does exist. If, however, such a perfect similarity did hold between any two or more individuals, and if it were once ascertained that a certain degree of contagious influence, or of any other morbific agency, could produce an attack of malignant cholera in one of these individuals, we cannot, from the very constitution of our minds, but believe that all the essential and collateral circumstances of the other individual or individuals being precisely the same in every respect, —the application to them of the same cause, with the same degree of intensity, would be followed by the same effect.

But even admitting for an instant, for the sake of argument, that no predisposition was necessary in order that the exciting cause or causes of cholera (whatever they may be) should produce their full and specific effects upon the body, and that consequently in every individual to whose system these causes were applied, the disease uniformly appeared, then, I fear, that, with such a doctrine, those who maintain the atmospheric or terrestrial epidemic origin of cholera, or any other origin whatever, of the disease, local or general, would find themselves involved in a dilemma much more perplexing and inextricable than even the exclusive contagionists would be. For while on this principle the contagionists would have to account for the appearance of the disease in all those, but only, be it remarked, in those individuals in a community who exposed themselves by having intercourse with the sick, on the supposition, on the contrary, of the epidemic origin of the disease, every individual without exception, in every apartment, house, street, village, or city, in which cholera prevailed, ought to have been affected with it, inasmuch as the local or general epidemic influence, which acted as the exciting cause of the disease, must have affected them all equally and at the same time.

Thus, for instance, (to revert again for illustration to the case of Bathgate,) upon the doctrine of a state of predisposition not being at all necessary for the full action and full effect of the exciting cause or causes of the disease, the contagionist would be unable to explain away the non-infection of nine out of twelve individuals in all who were exposed ; but upon the very same doctrine of non-predisposition, those who uphold the *local* miasmatic production of the disease would not only have the same difficulty in accounting for the escape of *these same* nine individuals, but of all the inmates, amounting to 38 or 40, of the first large land of houses, in which the cholera appeared in the village ; and again those who maintain the *general* epidemic origin of the malady must, in addition to these said twelve cases, explain away also the non-infection of all the 2088 other inhabitants of the place who remained unattacked, computing the gross population of the town to be 3000.

There is one modification of the argument against the doctrine of contagion, that is grounded on the non-infection of all the individuals exposed, which has been much insisted on by various authors, particularly of the French school, but that appears to me to be only a degree more truly untenable than the original argument itself, which we have just now been considering. I allude to the supposed definite evidence which some medical men have flattered themselves that they have furnished against the contagion of cholera, and which is based, *not* upon the circumstance of all those who were exposed not been invariably affected, but merely upon the isolated fact that they themselves have escaped ; and that too in despite of their having slept in cholera beds, lain with patients labouring under the disease, inoculated themselves with the blood of cholera subjects, swallowed quantities of cholera evacuations of all kinds, and performed other similar deeds of an equally reckless and equally useless character. To all such redoubted logicians, we would beg simply to reply with the quaint, but certainly very just remark of Dr Hodges, an old author who wrote on the London plague of 1665. " Certainly," says Dr Hodges, (p. 18,) " such persons might as rationally affirm that bullets will not wound and kill, because some in the hottest battles amidst showers of small shot, walk untouched by any of them, whenas these escape rather upon the account of the various happy postures they are in during the charge, than their fancy of being shot-free," or from any want of power of wounding or killing in the bullets themselves. (See " Collection of valuable and scarce pieces, relating to the last Plague in 1665." London, 1721.)

Note by the Editors.

In the insertion of the foregoing paper, the Editors beg leave to observe, in order to prevent any misconception on the subject of which the paper treats, that they do not by the act of insertion become responsible either for the accuracy of the statements made, or for the validity and conclusiveness of the inferences deduced. These, it is almost superfluous to remark, must rest with the author of the paper.

The paper of Dr Simpson is, it must be admitted, an able exposition of the facts and arguments which may be adduced in support of the opinion, that under certain circumstances cholera appears to affect successively different individuals, in the manner of a disease which is propagated by contagion; and in this point of view it constitutes a useful collection of facts and arguments, which deserves the attentive perusal of all those who wish to understand thoroughly the two sides of this difficult and obscure question. It must, on the other hand, however, be observed, that the view here given embraces but a small portion of the inquiry relative to the etiology of cholera, and the mode or modes in which it may be propagated. It overlooks entirely the important fact, that no quarantine regulations, no measures of seclusion, non-intercourse or segregation, have been capable of preventing the appearance of the distemper in the different cities and countries of Europe, or resisting its progress when it had once appeared. It overlooks also the fact, that the distemper, when once developed in any community, did by no means prevail among the inhabitants in the ratio of exposure to the sick, but almost always in a ratio between which and the degree of exposure it was totally impossible to trace any connection. Again, it overlooks another fact, that the disease, after expending its virulence on a certain part of the population, in all the instances which came to our knowledge, gradually became extinct, or, as it were, died a natural death, neither accelerated nor retarded, neither aided nor opposed by the various agents and measures which the doctrines of contagious propagation suggested.

Upon the method of investigation pursued by Dr Simpson in his inquiry, and in establishing the point for which he appears as an advocate, it would lead the Editors into too lengthened a notice to make those remarks which the subject undoubtedly demands. This only it may be proper at present to say, that though the fact of succession in the attacks be established, it does not thence follow, that this succession indicates the relation of cause and effect. It must be a principle more necessary in medical reasoning than in any other species of inquiry, that, though in establishing the relation of cause and effect, we do no more than indicate the circumstance of the latter event succeeding the former, yet we are not entitled to infer the constancy of the converse proposition, viz. that when we establish the fact of succession between two events, we thereby establish the relation of causation. Succession in medical facts, in short, is very similar to coincidence,—in one proportion of cases merely accidental, in another class, the evidence of the operation of one or more causes of a general and comprehensive character.

In reference to symptoms of cholera occurring in one person who has been in communication with another who has been in an infected locality, while the second person attacked had not been in the locality so designated, we know, that in the production of symptoms of cholera, so much depends upon the state of the individual at the time, upon the condition of his health, upon the state of his digestive organs, upon the food and drink which he has been taking, and even upon the state of his mind, that a great and abundant source of fallacy must exist in drawing any conclusions from this source regarding the doctrine of contagious propagation; and we have found it impossible to trace in cases of this kind any connection indicative of the operation of contagion.

But in this inquiry the question constantly recurs, by what means did the first cases take place; what contagion operated in the production of these? What contagion, for instance, induced the case observed at Newbigging by Dr Stephen on the 15th of July 1831,* or that treated at Adam's Row, Newton parish, between the 6th and 10th of January 1832, by Mr Steele of Craighall, and recorded by Mr Hamilton Bell. † If these cases took place independently of the supposed principle of contagion, might not other cases, to the amount of five, ten, or twenty, take place in the same manner? Is there any good reason for assuming, as a cause in producing one set of cases, the existence and operation of a principle which could not have operated in another set?

We refrain from adverting to cases in which attendants in the closest possible intercourse with the sick never betrayed any symptoms of the disease; because we are aware that the advocates for the doctrine of contagious propagation very justly maintain, that one or even many negative facts prove nothing against a single positive fact. But we must nevertheless say, that we look on these facts in a very different light, viz. as illustrating the operation and influence of causes confined to or seated in the person of the individual. But were it not to extend too far the limits of this note, already too long, we could specify, in the epidemic of 1832, a considerable number of examples in which, notwithstanding the freest and most unrestricted communication between the sick and the healthy, no instance of attack among the latter in consequence ensued; and we further know, that during the four months, extending from the end of August to the end of December 1837, various isolated, or sporadic cases as they are termed, took place, and no example of subsequent attack in any of the individuals connected with the sick ensued. During that space it may be mentioned, that three cases of this kind fell under the personal observation of one of us,—one in September, one in November, and one in December, the first terminating favourably, the other two fatally. Yet though in the first two cases the individuals were treated at their own homes in the midst of their families, none of the other inmates were affected; nor in the third, though treated partly at home, partly in a public institution, yet without observing precautions of non-intercourse, was it known that any person was thence attacked by the disease.

---

* Edinburgh Medical and Surgical Journal, Vol. xxxix. p. 356.

† Treatise on Cholera Asphyxia, or Epidemic Cholera. By George Hamilton Bell, F. R. C. S. 2d edition, Edinburgh, 1832. P. 240.

It may be argued that it is impracticable in this manner to deduce conclusions regarding the propagation of cholera by or without contagion. This inference we willingly admit, and would add, that it is the only inference that can legitimately be deduced from the facts afforded by the inquiry. These facts indeed show that arguments against the contagious propagation of the disease are more numerous and stronger than those in favour of that mode of propagation; and that merely a doubtful evidence can be adduced in support of the latter hypothesis. Strict and accurate logic would disown inferences not supported by decided and unquestionable evidence. So much more justly would it disown inferences which at the most are mere presumptions, and a mode of explaining the occurrence of events which cannot readily be explained in any other mode.

Lastly, what is contagion, it may be justly asked? Is it not an assumed method of accounting for the propagation of diseases, which our ignorance prevents us from explaining by any more palpable agent? Is it not then a mere offspring of the imagination; and if such be the case, ought we to admit its existence and operation on any other than the clearest and most unquestionable evidence; and if other means of explanation be accessible, ought we not rather to reject it entirely?

The considerations now adduced, derive, the Editors conceive, strong confirmation from the recent experience afforded by the epidemic prevalence of the disease in Milan, Naples, and Malta. We may probably take an early opportunity to direct the attention of our readers to the history of these epidemics; and it will then be seen to what extent the facts thereby furnished are favourable or hostile to the opinion, that contagion has much to do with the propagation of the disease.

ART. IV.—*Observations on Cholera as it appeared at Collieston and Footdee, Aberdeenshire.* By JOHN PATERSON, Esq. Surgeon, Aberdeen.

AFTER the numerous and contradictory opinions which have been given as to the contagious and non-contagious nature of cholera, and the very opposite accounts published of the success of its treatment, a few practical remarks may not, it is hoped, be deemed ill-timed, now that the disease rages in the southern parts of Europe; and that we are enabled to argue the subject coolly and dispassionately, free from the panic which, during the prevalence of the distemper in this country, seized all classes of the community, not even excepting the members of the medical profession.

Soon after the disease made its appearance in Aberdeen, I was sent by the Board of Health to Collieston, a fishing village a few miles north of Aberdeen, having my memory stored with innumerable remedies of the most opposite kinds for the cure and prevention of the disease, the greater part of which I found unsatisfactory, and for the most part unavailing.

In all diseases, age, sex, and constitution must greatly modify the treatment, and in none perhaps more than in cholera, where the disease proceeds with such rapidity, and where any two cases often require a totally opposite line of treatment. And so much was this the case at Collieston, that I found it necessary soon after my arrival to change entirely my theoretical views, and treat the disease according to the varying symptoms as they arose.

My practice while at the above village was much more successful than it was afterwards at Footdee, another fishing town in the suburbs of Aberdeen; for there the fishermen are of very *dissipated habits*, while at Collieston they are comparatively free from the vice of drunkenness, and being naturally powerful and robust subjects, I seldom failed in recovering them by the guarded use of the lancet, when called at an early stage. In addition to a moderate use of the lancet at the very outset of the disease, my treatment in general consisted in the exhibition of saline medicines, sometimes combined with the *Liquor Opii Sedativus*, or with small doses of calomel and opium; together with warmth to the surface of the body, and a variety of internal stimuli in the more advanced stages. The *Mistura Rhei* was also employed with a view to carry off any feculent matter that might be lodged in the bowels keeping up irritation. But in most of the cases where the lancet was used at the proper period little else was required. The patient, although in an apparently hopeless state at the time of my first visit, was in these instances not unfrequently in the course of twenty-four hours out of danger, and free from all complaint, unless from that of weakness, which alone prevented him from going about his usual employment. I must observe, however, that bleeding in old people, and in those of a feeble and depraved constitution, was found decidedly detrimental; and stimuli, external as well as internal, though assiduously applied, were also in my experience of little use. Such patients rapidly sunk.

On my arrival at Collieston the excitement and alarm were extreme. All work was suspended; since, indeed, the villagers had been prevented by the public authorities from entering the neighbouring towns with their fish for sale. Thus immured in their small and dirty hovels, all mental and physical energy forsook them. No arguments could prevail upon them to go to sea or engage in their customary employment ashore, and they continued day after day brooding over and magnifying the danger, anticipating the most fatal results from the few deaths which had occurred before my arrival. I lost no time in endeavouring to calm their fears, and in recommending the adoption of warm clothing, nourishing diet, air, and exercise. In this manner I gained their confidence, and having shaken their belief in the contagious origin of the disease, I had well nigh succeeded in getting the healthy to throw off their fears and return to their customary avocations, had my exertions in this respect not been frustrated by the troublesome, and I firmly believe useless, enactments of the Board of Health, which prohibited the inhabitants from seeking a market in the surrounding country. And thus, not only were they deprived of the proper stimulus to labour, but their fears were greatly augmented, and their domestic comforts diminished by the restrictions just referred to. Besides this, most of the families had their winter stock of half-dried fish unsold, and piled up in heaps in their small and ill-ventilated cottages,—another circumstance which probably added to the malignity and spread of the disease amongst them.

Before I went to Collieston, I was a firm believer in the contagious nature of cholera. There, however, where I had many opportunities of informing myself as to the contagious or non-contagious character of the distemper, I was soon led to doubt the correctness of my former opinion, at least in so far as regards the *virulence* or potency of the contagion. For although the disease did not extend beyond the village into the agricultural portion of the parish, and although I could trace its progress in almost every instance from the house of one relation or of one neighbour to that of another, I am nevertheless disposed to think that this arose rather from a powerful combination of the ordinary causes of disease, moral as well as physical, aided doubtless by a peculiar epidemic state of the atmosphere then and there existing. For instance, the sound of the funeral bell, the death or burial of a relation or next-door neighbour, produced extreme excitement and alarm, and was almost certain to elicit a new case of the disease in a few hours thereafter. So great was the alarm at one time, that it was with much difficulty the females could prevail upon the male relations to accompany the bodies of the deceased to the grave. Some of them would not enter the house; others fled from the village; and nothing but the superstitious notions prevalent among them, coupled with a sense of shame (for they are proverbially kind to one another during disease or any other calamity,) could induce them to remain. Their horror of contagion on my first arrival was extreme. I have seen one brother in previous good health rendered, through fear and grief, almost senseless, while in the act of carrying a deceased brother to the grave.

Such were some of the more immediate effects produced by the panic under which the villagers laboured; and when we consider that this powerful agent was acting upon individuals who were filthy in their habits, and otherwise ill prepared for withstanding an epidemic influence of a depressing character, especially when deprived of the opportunity of pursuing their ordinary vocations by reason of the prohibition against their admission to the surrounding country, we need not be surprised at the readiness with which the fatal malady wrought its way amongst them. Ultimately I was obliged to forbid the tolling of the bell, to discountenance the attendance of relations at funerals, and make the nurses do every thing even to the nailing up the coffin. At one time, indeed, the panic was so great that the carpenter fled from the village, leaving the coffin at the door of the deceased. I mention these facts to show how necessary it is that all means should be used by the proper authorities, rather to allay unnecessary alarm, than to increase it, by making vexatious laws and regulations which have a tendency only to produce a contrary effect. I must confess, that the greater part of my professional duties consisted in inspiring confidence, and in recommending warm clothing, nourishing diet, and attention to cleanliness; urging and enforcing their observance of such things as forming the best prophylactic against the dreaded malady; and I am satisfied that I accomplished not a little good by steadily pursuing this course, believing, as I do, that fear was a most powerful predisposing cause. By allowing my clothes to be brought in contact with the bodies of the sick, I still further succeeded in dissipating their fears; indeed, I have more than once unwittingly, while in the act of bleeding, had my clothes contaminated with the discharges, and from fatigue have lain down across my bed without changing my clothes, and slept for some hours in this state without any bad effects.

I have been induced to put together these few desultory remarks at this late period, from having lately seen one or two suspicious cases of disease in this neighbourhood; and chiefly with the view of expressing my opinion, that, should this fearful malady ever again become epidemic in this country, those in power would do well to pause before they again impose their imaginary salutary restrictions. It is certainly right that the advice and opinion of the highest medical authorities should be listened to in such emergencies, but along with theirs, the advice of the conscientious and hard-working practitioner should also be listened to, seeing that every fact derived from practical observation is of great importance, where learning and genius have as yet contributed nothing beyond vague hypothesis.

In so far as my practical acquaintance with the disease leads me to form an opinion, all embargoes on trade should be done away with, as also many of the other restrictive enactments that were put in force on the late occasion. Of its contagious nature, at least of the virulence of it, as asserted by several writers, I entertain great doubts; and I think I can fully account for the spread of the disease at Collieston and other fishing villages along the coast,—from fear and other depressing causes, operating upon an ignorant and superstitious set of people, indulging in a similarity of feelings and associations, the whole village constituting as it were one family, every member of which sympathized keenly with the sufferings of his neighbour.

Moreover, the cold and wet, particularly the frequent exposure to the moist atmosphere on the coast during the autumnal months, had a share in its production and propagation; for at similar places along the coast, and where, be it remarked, the disease in question was most severe, the inhabitants are notoriously liable to bowel complaints at this season of the year. But of the fact, that a peculiar atmospheric influence had much to do with the epidemic, I am fully satisfied, although in regard to its mode of action and its peculiar nature I can say nothing. Nor do I think that the question has as yet been settled by any one of the many writers who have appeared.

Aberdeen, 10*th November* 1837.

ART. V.—*On Epidemic Puerperal Fever.* By J. T. INGLEBY, Lecturer on Midwifery at the Royal School of Medicine, Birmingham.

ALTHOUGH no subject in medicine has undergone more discussion with fewer practical results than that of puerperal fever, I have ventured to adduce a series of facts in support of the opinion, that a very close connection subsists between this disease and erysipelas. This opinion, ancient as it is, has been only very briefly alluded to by our two latest writers on the subject, Dr Robert Lee* and Mr Moore.† Dr Lee admits, "that there is some connection between erysipelas and puerperal fever," although he observes, "it is extremely doubtful if serous membranes are liable to attacks of erysipelas;" and, again, in order to establish the doctrine in reference to uterine inflammation, he further observes, "it is requisite that some decided difference should be perceptible in its products, in the changes of structure, in the progress of symptoms," &c. alleging that he "has not observed any thing to justify this distinction. Mr Moore merely allows, that "the opinion which regards erysipelas and puerperal fever as similar, is certainly much supported by certain facts connected with their common origin." Every attempt, therefore, to elucidate the subject by adducing additional facts, so as to confirm or invalidate the opinions already held respecting it, can scarcely fail to prove useful. In no disease, indeed, is the utility of recording the principal facts more obvious than in this. At the present day the treatment of puerperal fever is attended with much embarrassment, especially to the young practitioner, who, aware that the systems recommended by men of equal eminence are diametrically opposite, becomes bewildered and falls into error. Fully conscious as I am, that such discordant opinions exist, I approach the subject not in a controversial spirit, but simply to give an account of my own personal experience of the disease, embracing a brief exposition of its several forms and chief symptoms, the pathology of modern times, and the effect of medical treatment.

---

* Lee's Researches, p. 99.

† Moore on Puerperal Fever, p. 145.

The term *puerperal fever*, although quite unobjectionable in its proper signification, is so strangely misapplied, and comprehends so many different disorders, that it certainly is calculated to impress the mind with delusive ideas, and may thus lead to very serious errors,—errors which have been satisfactorily exposed by Dr Robert Lee and others. In opposition to former views upon this subject, the conviction has been forced upon me, that puerperal fever is not a type of *peritonitis* modified by the circumstances of parturition, but a disease not necessarily implicating the peritoneum, although usually extending to it, frequently appearing as an epidemic, and like other epidemics very severe at its onset. I assume it as an incontrovertible fact, that in every epidemic there exists some peculiarity which distinguishes it from past epidemics, either as respects the character of the disease, the effect of remedies, or the researches of pathology,—a circumstance in support of the opinion that the large bleedings practised by Gordon, Hey, Campbell, and others, when inadmissible, do not necessarily give place to the direct stimulant and cordial treatment, as advocated by those eminent authors, the late Dr J. Clarke and Professor Hamilton.

Etiology.—By some writers this disease has been referred to the same causes as common fever; but an epidemic state of the atmosphere, and contagion, are the only causes which seem entitled to consideration. We know, indeed, that certain noxious properties of the air favour the production of the disease. Armstrong attributes the Sunderland epidemic to this cause, and Leake seems to have entertained similar sentiments, remarking that the disease "will always be found most fatal when most epidemical, that is, during a distemperature of the air." It is needless to multiply quotations in support of a position which I conclude will scarcely be disputed at the present day. The doctrine of a specific contagion is founded upon a body of evidence which seems equally irresistible. Dr Lee inclines to the opinion, that the disease is *sometimes* communicable by contagion, yet doubts whether the character of the inflammation be common or specific.

Armstrong, in opposing the doctrine of contagion, observes, "If the puerperal fever be not contagious when it is sporadic, it becomes a most interesting question to ascertain whether or not it be contagious when it is epidemic;" and in another place, having submitted the annexed query, "are puerperal fevers propagated by contagion?" the reply is, "this appears, after extensive observation, to be a very absurd proposition, and not borne out by facts."* Mackintosh also disbelieves in the infectious nature of the disease; but the circumstance he alludes to of Dr Hunter having lost thirty-one patients out of thirty-two, is a strong presumption in its favour. At Aylesbury, the contagiousness of the disease is declared to have been "as palpable as that of the small-pox." Moreover, the great fatality of the disease at every period of its occurrence in the numerous lying-in hospitals, both at home and abroad, admits of no other explanation. In an epidemic which recently occurred at Keil, it is stated on the authority of Dr Michaelis, that the disease almost invariably resisted every attempt to arrest its progress, until the hospital had been purified, and even refurnished. On this subject, indeed, the late Professor Young's experience is quite conclusive, and very many similar authorities might also be cited.

These are not solitary facts. It is said that two eminent practitioners conveyed the disease to a number of puerperal women in succession, in consequence, as is supposed, of having visited patients affected with typhoid diseases; and a physician of eminence recently assured me that he succeeded in tracing a number of cases of puerperal fever to a practitioner affected with low fever, but who continued to see patients until the fever compelled him to secede for a time from practice. I have myself frequently observed different infectious diseases going on in the same family. The following are the most striking of these instances.—A lady was attacked with puerperal fever of the most formidable character, from which, however, she recovered. During her illness she was attended assiduously by her two daughters; the eldest of whom, when the fever had been in full force for two days, was seized with typhus of the worst kind; and on the following day, the second daughter became alarmingly ill with fever and putrid ulceration of the throat. Both girls, though apparently hopeless, ultimately recovered. During the period of this illness, several members of the family were attacked with simple feverish disorders. In a second instance of puerperal fever, the servant was attacked with erysipelas, and in a third instance the nurse was compelled to leave her situation in consequence of a severe erysipelatous affection of the throat. Similar circumstances occurred at Aylesbury during the epidemic there. Our knowledge of infection is necessarily derived from its effects, and scepticism itself can scarcely withstand evidence like the foregoing. Although puerperal fever is not *necessarily* contagious, the erysipelatous form of the disease is essentially so—the fever and the local inflammation not depending one upon the other, but arising together as the effect of one common cause.

---

* Lectures by Rit. p. 630.

Have not nurses and medical men been identified as the actual medium of communicating puerperal fever from one patient to another? Dr Campbell thinks that "unless the practitioner has been engaged in the dissection of the bodies of those who have fallen victims, the disease cannot be conveyed by him from females labouring under it to others recently delivered." * But the fact of the extension of the disease in this manner from the living subject has been most satisfactorily shown by Mr Roberton. I have repeatedly observed the same myself, and have submitted a number of cases in illustration. I have also adduced the strongest grounds for believing, that the effluvia derived from the body of a woman who died from puerperal fever were conveyed in this manner by two practitioners, and rapidly produced the same disease in two other females. "The circumstance which excites the infection of puerperal fever, (says Gordon,) seems to prevent typhus,"† and yet we are by no means certain that, under particular states of the system, the contagion of typhus may not actually generate puerperal fever. Dr Collins having made an allusion to the case of two women who died from puerperal fever, and occupied beds adjoining that of a woman who died from a bad form of typhus with petechiæ, makes the following remark. "In October 1827, when I was resident as master, an occurrence precisely similar took place. A patient in typhous fever was admitted at night in one of the labour wards, where she remained for some hours. The ward contained four beds. The three women occupying the other beds were attacked with puerperal fever, of whom two died."‡

For many years Birmingham has been remarkably exempt from epidemic and pestilential complaints—an exception owing partly to its elevation and the dryness of its soil, and partly to the superior comforts of the poorer classes of society. Within the last twenty years, however, puerperal fever has appeared amongst us on two or three occasions; but its visitations proved comparatively light, both as respects the duration of the disease and its severity. About the year 1826, the disease broke out in the obstetric ward of the town infirmary, and a number of deaths, sixteen or eighteen, occurred in succession; indeed, according to the recollection of two medical friends at that time attached to the institution, not a single instance of recovery took place. "The *post mortem* appearances (observes one of these gentlemen) were by no means uniform in the different cases. In some there was considerable effusion of serum with flocculi floating in it, and increased vascularity of peritonæum; whilst in others, and in one in particular, the morbid appearances were remarkably slight. The internal surface of the uterus was covered with a dark-coloured greenish pulpy substance." A drawing in my possession, obligingly given to me by Mr Blount, is illustrative of the appearance in question. A fresh ward was now substituted, and the disease disappeared. A few fatal cases occurred in the town in the years 1829 and 1830; but I am unacquainted with the details. Softening of the uterus and serous effusion constituted the principal morbid appearances.

---

* Lon. Med. Gazette, 10th Dec. 1831, p. 353.

† Ibid. 7th Jan. 1832, p. 503.

‡ Pract. Treatise, p. 381.

In the year 1833, puerperal fever reappeared. At that time erysipelas prevailed generally, both in the town and its general hospital; and I am fully authorized in saying, that almost every wound under treatment in this institution assumed an erysipelatous character, and several of these cases proved fatal. Assuming this to be a mere coincidence, the fact itself is a remarkable confirmation of the correctness of Dr Gordon's statement to the same effect in connection with the epidemic at Aberdeen.

It is difficult to compute the actual number of cases of puerperal fever which occurred at this time; but I think the number of severe cases amounted to about twenty-six, eighteen of which terminated unfavourably. A few mild cases followed these, and degenerated into fever of a continued kind, ending favourably. Seven of the twenty-six cases appeared almost simultaneously in the practice of one individual; and five of these terminated in death. The utmost entreaties were urged in vain, to obtain an examination of the first fatal case, but we were permitted to inspect the second. Previous, however, to this being accomplished, new cases had arisen, and were then under treatment. General bleeding was early resorted to, and under circumstances apparently favourable for the trial; but the practice was abandoned as soon as the true pathology of the disease was ascertained. It is worthy of remark that of these seven patients six died; while the seventh, who was not bled at all, and in whose treatment a singular mistake occurred, ultimately recovered. Two grains of tartarized antimony, two grains of opium, and twenty of calomel were, instead of being divided into four parts, administered to this patient at one doses, with no other effect than that of copious diaphoresis. The symptoms at their onset were very severe. A few cases of puerperal fever appeared in 1834, and the beginning of 1835, and also in 1836, erysipelas being very prevalent during the whole period. During the prevalence of the erysipelatous epidemic, it was a matter of observation that inflammatory diseases in general, and pulmonary affections in particular, would not admit of the active treatment usually adopted for them. A question now arises, whether serous surfaces are susceptible of erysipelatous inflammation? Dr Lee's opinion has already been adduced, but is not the character of every inflammation modified according to the tissue affected? The synovial membranes in their structure and functions approach nearer the serous membranes than any other tissue. And does not erysipelatous inflammation extend from the integuments to the synovial membrane?

If Dr Williams's views* are correct, that erysipelas is a contagious and infectious disease, caused by the agency of a morbid poison, the same as that which produces puerperal fever, both diseases depending upon a common cause, what is to prevent the contagion of erysipelas giving rise to puerperal fever? It did so, in fact, in the epidemic at Aylesbury.

I propose now to advert briefly to the facts already recorded in support of the doctrine advocated in this paper, and afterwards to submit my own cases in confirmation of its justice.

Dr Johnstone, the esteemed and venerable President of our School of Medicine, in his Inaugural Dissertation on Puerperal Fever, published at Edinburgh nearly sixty years ago, † has not only adverted to the connection itself, but has also related a case in which erysipelas appeared on the arms of a patient affected with this fever the day preceding her death.

Kirkland makes the following incidental allusion to erysipelatous affections in puerperal women. "Some years ago an erysipelatous sore throat, accompanied with an efflorescence, prevailed in my neighbourhood; and several women in child-bed were seized with the disorder." ‡

"That the puerperal fever (observes Dr Gordon,) is of the nature of erysipelas, was supposed by Pouteau§ forty years ago, and has been the opinion of Drs Young and Home of Edinburgh since that time. I will not venture positively to assert that the puerperal fever and erysipelas are precisely of the same specific nature; but that they are connected, that there is an analogy between them, and that they are concomitant epidemics, I have unquestionable proofs. For these two epidemics began in Aberdeen at the same time, and afterwards kept pace together. They both arrived at their acme together, and they both ceased at the same time."* This author then adverts to the circumstance of almost every person admitted into the Aberdeen Hospital with a wound, at the time erysipelas was raging there, being soon after seized with erysipelas in the vicinity of the injured part. Dr Clarke, in his Essay on the Epidemic of 1787 and 1788, observes, that if inflammatory diseases occurred at all "they were principally of the erysipelatous kind."† That the character of the disease described by Dr Clarke is essentially different from the usual form of peritonitis is quite clear; for under no other supposition can we reconcile his statement, that the proper treatment of the common inflammatory affection "is exceedingly detrimental in the epidemic disease, or where there is an affection of the abdomen along with a low fever."‡

---

* St Thomas's Hospital Reports. No. 3, p. 327 and 358–9.

† "Dissertatio Medica Inauguralis de Febre Puerperali," 1779.

‡ On Child-Bed Fever, p. 143.

§ Treatise on Puerperal Fever, p. 56.

In connection with the Leeds epidemic, Mr Hey observes, "no disease was so prevalent as to deserve the name of an epidemic, except erysipelatous inflammations, which prevailed during the whole period of the puerperal fever, and in many cases were of a very malignant kind: insomuch, that I do not recollect ever to have seen worse cases of erysipelas than at that time."—P. 19.

The connection is clearly shown by Mr West in his account of the disease which prevailed in the neighbourhood of Abingdon.—"I know not (he remarks) of any instance of puerperal fever occurring in any village where there were not cases of erysipelas."§

In the contagious epidemic puerperal fever which prevailed in Aylesbury in the autumn of 1831, the connection appears still more striking,—"That the two diseases (observes Mr Ceely) had a common origin;—that the puerperal disease and the prevailing erysipelas were identical, and each capable of producing the other, was soon placed beyond doubt, by the fact of every puerperal case giving rise to numerous cases of the common epidemic, in the persons of the nurse and attendants. The puerperal disease then was esteemed a modification of the prevailing contagious epidemic;—it was erysipelas of the mucous membrane of the vagina and uterus, extending into the abdomen through the Fallopian tubes, and from them by contiguity and continuity of surface to the parts above described."‖ It is also stated in reference to the pathology of the disease, that "there was not the slightest trace any where of adhesion, or of the presence of coagulable lymph."

The uterus was found to be very large; the peritoneum covering the organ and its appendages was injected; the mucous membrane was also injected, and of a dark colour; and whey-coloured serous fluid was effused within the cavity of the peritoneum.

---

* Vide Melanges de Chirurgie, p. 180, et seq.

† Practical Essays, p. 105. ‡ Ibid. p. 143.

§ Medical Repository, Vol. iii. p. 105.

‖ See Mr Ceely's paper, Lancet, 7th March 1835, p. 813.

A connection between erysipelas and puerperal fever is also supported by Dr Samuel Cusack, constituting, according to his arrangement, the second or low form of the disease. "Seasons," he observes, "which give rise to erysipelas appear to favour its occurrence." Several facts stated by Dr Lee are in favour of the same* connection, although rather opposed to this author's opinions of the character of the disease.

"I have little doubt," observes Dr Abercrombie,† "that women in the puerperal state are liable to two distinct forms of peritonitis, which, in the discussions on this subject, have probably not been sufficiently distinguished from each other. They are liable to the common acute peritonitis presenting the usual symptoms, yielding in a large proportion of cases to the usual treatment, and exhibiting in the fatal cases the usual morbid appearances of extensive pseudo-membranous deposition and adhesion. But they are likewise liable to another form of disease, in which the symptoms are more insidious, and accompanied at an early period by great prostration of strength, and fever of a typhoid character. This affection runs its course with great rapidity; it does not yield to, or does not bear the usual treatment, and it shows on dissection chiefly extensive effusion of a sanious, milky, or puriform fluid, with much less adhesion than in the other case, often with none, and frequently without any sensible changes in the appearance or structure of the parts. There is little doubt that it is a contagious disease, or that it is capable of being conveyed from one woman who is affected with it to another who is in the puerperal state. It appears as an epidemic at particular times very frequent and very fatal while it prevails, and erysipelas or other affections of an erysipelatous character have often been observed to be prevalent at the same time." "Puerperal fever," says Collins, "has also become epidemic in our hospital upon several occasions when typhous fever prevailed in the city, and at other periods when erysipelas was frequently met with."‡

CASES.

First Series.

I purpose, in the first place, to give a very brief summary of the several cases of puerperal fever originating in the contagion of erysipelas, and then to examine separately the features by which they were principally characterized. I have deviated from the order usually pursued, under the impression that the plan of detailing at length cases marked by a similarity of character is usually tedious and uninteresting.

---

* Edin. Med. and Surg. Journal, Vol. xxxi. p. 25.

† Pathological and Practical Researches, p. 189.

‡ Practical Treatise, p. 381.

Case 1.—In the year 1833, a medical friend was in attendance upon a lady affected with erysipelas. On one occasion, after making incisons into the inflamed structures, he went directly from this patient to a lady in labour, whom he delivered at 6 p. m. of Wednesday, 28th August. It is worthy of remark, that although this was a *primipara,* the patient continued to be harassed with pains like after-pains from the time of her delivery until the occurrence of the rigor, on the afternoon of Friday. *Result fatal.*

Case 2.—On the same evening as the subject of Case 1 was delivered, and almost immediately afterwards, my friend attended another labour, also a *primipara,* and which terminated rather rapidly. The following day the patient was feverish, and the disease had clearly commenced. *Result fatal.*

Case 3.—The same gentleman delivered his next patient on Monday morning, September 3d. She had severe after-pains the whole of the day and night, and the rigor took place early on the morning of the fifth. *Result fatal.*

Case 4.—The fourth patient attended by the same party was delivered on Tuesday, 4th September. The feverish symptoms commenced early on the morning of Thursday. *Result favourable.*

Cases 5 and 6.—These two cases occurred in the following manner. My friend and his assistant having been engaged in the evening of the 5th of September in conducting the *post mortem* examination of the subject of Case 2, went in the same dress each respectively to a case of midwifery. The one patient was delivered the same evening, and was seized with the rigor about thirty hours afterwards. The other patient was seized with a rigor the third morning after delivery. *One recovered, one died.*

Case. 7.—The same practitioner delivered the subject of this case on the evening of the 7th September—having first seen her on the morning of the 6th, in the same clothes as he wore when examining the body of Case 2, the preceding evening. An unaccountable kind of depression followed the delivery; but the rigor did not take place until the evening of the fifth day from the first visit. *Result fatal.*

Several cases of a mild character followed the foregoing seven, and their nature being now most unequivocal, my friend declined visiting all midwifery cases for a time; and there was no recurrence of the disease.

Second Series.

The next cases were no less decisive in their character.

Case 1.—A practitioner, who had been engaged in dressing some extensive erysipelatous wounds of the arm, the result of long incisions which had been made in the parts, was called within half an hour afterwards to a case of midwifery. It was a

placenta presentation, and he was assisted by a friend by whom he had been assisted in dressing the erysipelatous wounds. The patient was delivered at midnight of Tuesday. *Early* the following morning she was feverish. The same day at noon the rigor took place, and death occurred on the following Saturday.

The nurse became feverish and ill.

Case 2.—This patient was delivered late at night by one of the practitioners alluded to in the last-mentioned case, six or seven hours after dressing the erysipelatous wounds. During the course of the night she became excessively feverish, and remained so the whole of the following day, on the evening of which the rigor took place, followed in five hours by a second. Both rigors were very severe. Fortunately the system was rapidly placed under the mercurial influence, and the patient recovered. The nurse was seized with a violent erysipelatous inflammation of the throat. The proper precautions were promptly adopted, and the symptoms ceased.

Third Series.

The third series of cases occurred in November 1836.

Case I.—Having accidentally witnessed the *post mortem* examination of a young woman who died in our town infirmary very soon after admission, and having recognized the same morbid appearances as characterized the first series of cases, I went immediately to the residence of the practitioner by whom she had been attended, and made inquiries respecting her illness, and whether he had seen other case or cases of a similar kind. His reply was rather inconclusive. I ascertained that he had delivered this poor woman shortly after he had opened several erysipelatous abscesses. On Tuesday midday, some hours after delivery, he found her extremely ill. The following day she was removed to the Infirmary, and died in the course of the night. I stated my suspicions, and requested him to be strictly on his guard in watching the patients he had delivered within the few last days. This conversation occurred on the Thursday morning.

On the Saturday evening this gentleman called upon me to say he had three patients ill of the same disease as noticed in the preceding case, and requested me to visit them.

Case 2.—Mrs B. was delivered Tuesday, 8th November, at 6 P. M., and within twelve hours afterwards the pulse was 160. She died early on Sunday morning.

Case 3.—Mrs B. was delivered on Tuesday, 8th November, at 4 o'clock A. M. The attack was preceded by violent after-pains, and came on within twelve hours after delivery. She survived until the following Monday.

Case 4.—Mrs Y. was delivered on Thursday, 10th November, at 4 P. M.—She died the following Tuesday.

Case 5.—Mrs —— was delivered on Monday, a rigor occurred on Tuesday at 3 P. M. and she died on the Monday following.

Case 6.—Mrs —— was also delivered on Monday, about 1 A. M.

The symptoms did not come on until the following Thursday. She died on the fifteenth day after delivery.

Case 7.—I have not the date of this patient's delivery. She fortunately recovered.

The foregoing seven cases were all attended by the same practitioner. He then discontinued his practice for a time. It was not thought desirable to examine the body in all the cases after death, fearing the further propagation of the contagion. I hold myself responsible for the accuracy of the foregoing report, having seen the greater part of the cases at some period of the disease, but usually after blood-letting had been resorted to.

The following additional evidence in support of the opinion now stated regarding the contagious nature of this disease is not without its importance.

Case 1.—Mrs —— was seized with puerperal fever, thirty hours after delivery, and died in forty hours afterwards. I saw the case two hours before death. The practitioner informed me that, for some days previous to the delivery, he had been engaged in dressing a severe erysipelatous sloughing wound.

Case 2. This case in all essential particulars may be regarded as the counterpart of the last. A farmer, residing in a village, fell from his horse, and received a severely lacerated wound of the scalp. Erysipelas and typhoid symptoms supervened, and the man died. The medical attendant had several midwifery cases in or near to the village. One of the patients had an attack of erysipelas, ending in premature labour and death. Others were attacked apparently with puerperal fever. Of these some did well and others died. My friend remarks, "I have no doubt of the connection of the whole of the cases with the case of external erysipelas, and of its being contagious."

During the prevalence of erysipelas in the Birmingham Hospital, several women in its immediate vicinity were affected with puerperal fever. Three of these died. The first was delivered by a dressing pupil of the hospital; the second was the wife of the brewer of the establishment. In both these cases the communication was almost direct. The circumstance of traumatic erysipelas having been observed to terminate in peritonitis has an indirect bearing on this species of puerperal fever. At the period when these cases occurred, a girl in the hospital had some warty excrescences removed from the pudenda. Symptoms of peritonitis ensued, and proceeded to the fatal event; and on examination the morbid appearances were found to correspond with those, by which the fatal cases of puerperal fever had been characterized.

Enough has been adduced in support of the connection between erysipelas and puerperal fever. Impressed with these views, it seems to me that no practitioner ought to pass from a person affected with typhus, erysipelas, or similar infectious diseases, or from the *post mortem* examination of a puerperal fever case to a woman in labour, or in the puerperal state, without premising ablution, a complete change of linen, and every other needful precaution,—an echo of the sentiments already expressed on this subject by Gordon, Armstrong, and Lee.

It has not been ascertained through what particular channel the deleterious matter enters the body, whether through the pulmonary, the generative, or the capillary system. I conclude it may be received through any of these channels. The attack has been known to take place antecedent to delivery, but I am acquainted with only one such instance. Neither is it determined whether the disease primarily attacks the sanguiferous or the nervous system. Influenced by the researches of Stevens relative to the diseased state of the blood in fevers, and also by the experiments of Christison and others, an opinion has been recently expressed in a very able and elaborate review of Moore's work on puerperal fever,* that the affection commences in the blood. It is extremely difficult not to say impracticable to determine this point, but considering the violence of the after-pains, and the depression of the system which in some of the foregoing cases preceded the rigor, the attack may be supposed to have begun in the nervous and muscular, and not in the vascular system.

In these cases, moreover, the blood taken from the arm did not exhibit any thing unusual, being only slightly buffed; but in one of them, the appearance of the blood simply considered would certainly have justified blood-letting, the crassamentum being large and firm, and the amount of serum disproportionate.

As the disease approaches a fatal termination, the blood, I believe, usually undergoes a peculiar change, becoming perfectly fluid, and resembling claret both in consistence and colour. In Cusack's cases "the blood formed a soft coagulum broken up by the slightest violence."

Adverting to Dr M. Hall's test, Mr Ceely states, that in the cases at Aylesbury, the blood at the onset of the attack was very thick and pitchy, but assumed a brighter colour at the expiration of eight or ten hours, in connection with an increased fulness of the circulation.

The duration of the disease must entirely depend upon the nature of the epidemic. At Sunderland the disease ran its course in five days. At Leeds often in forty-eight hours and even less.† In my own cases the period was not uniform. The system will be exposed to the infection so long as the uterine changes are in progress, but after the lapse of the first two or three days, the susceptibility gradually declines.

In Aylesbury, the fever appeared in three distinct forms, the acute, the low, and the insidious form, the disease essentially being the same, but modified by constitutional or other causes. Armstrong describes the stages of collapse and excitement, yet declares that the internal congestion may kill the patient antecedent to reaction supervening. The cases embodied in this paper and ending unfavourably were for the most part characterized by a steady increase in the symptoms; and although some variation was observable in this respect, the stages of collapse and excitement could not be distinguished subsequent to the appearance of the rigor.

---

* British and Foreign Med. Review, No. iv. p. 481.

† Hey's Treatise, p. 165.

Diagnosis.—Puerperal fever is supposed to have been confounded with a number of affections to which it bears but a feeble resemblance.

First, It is believed to have been confounded with intestinal irritation, a disease described by Dr M. Hall,* and said to resemble the idiopathic form of peritonitis; *secondly*, with irritative fever arising from decomposed animal matter, and denoted by rigors with more or less abdominal uneasiness, and marked pyrexia; and *thirdly*, with inflamed states of the cellular tissue of the pelvis, usually the result of violence in the course of delivery, and characterized by abdominal tumefaction, retention of urine, (the urine presenting a dark appearance,) and symptoms of a typhoid character. But if the lineaments of puerperal fever are too well-marked to admit of the disease being confounded with any of those just enumerated, can it be distinguished at its onset from the ordinary forms of acute peritonitis or hysteritis? At its first invasion, neither the presumptive evidence, nor yet the actual symptoms, may be sufficiently clear to display the true character of the disease, and establish just principles of treatment.

Dr Cusack describes three species of puerperal fever,—the highly inflammatory form, the low typhoid epidemic, or erysipelatous form, and a third form in which there is a combination of the phenomena that characterize the first and second. "There does not (he observes) exist in all instances between puerperal fever and peritoneal inflammation, a difference sufficiently evident to allow us to consider the two diseases of a perfectly distinct character." He at the same time allows that, in the first or common inflammatory form of peritonitis, two symptoms are constant and uniform in their occurrence, viz. extreme hardness and incompressibility of the pulse, and abdominal pain and tenderness,—while in the third, in addition to pain and tenderness, the pulse neither possesses the characters peculiar to the first, nor sinks into the weakness and compressibility of the second or erysipelatous form, with the collapse so common to it. Dr Douglas has also described three species of fever, the third being the genuine contagious or epidemical form of the disease.

---

* See Dr Waller's paper in Lancet, 5th Oct. 1833.

In puerperal fever the lochial discharge usually continues; in peritonitis it usually ceases, yet the exceptions to both are sufficiently marked. Symptoms of derangement in the functions of the brain are peculiar to neither; and abdominal pain and tenderness are certainly less uniform and severe in puerperal fever than in acute peritonitis.

As an occasional diagnostic symptom in peritonitis of the genuine kind, it appears, according to Dr Bright, that "when adhesion had taken place between the peritoneum lining the parietes of the abdomen and the peritoneum covering any portion of the included viscera, a peculiar sensation might be perceived by the physician who placed his hand over the part, which varied from the crepitus yielded by emphysema to the sensation produced by bending new leather in the hand." This mode of investigation can, however, be applied only to an advanced stage of the complaint, and indeed to that stage in which more or less lymph has been effused, and more or less agglutination has taken place.—See Medical Gazette for 14th February 1835, p. 697. Medico-Chirurgical Transactions, Vol. xix. and the Edinburgh Medical and Surgical Journal, Vol. xlv. p. 218.

Dr Lee disapproves of a remark made by Dr Gooch, that "the effects of remedies on a disease, if accurately observed, form the most important part of its history." The remark is perhaps too unqualified, but, as respects the commencement of an epidemic, it is practically correct. Dr Lee's diagnosis, as applicable to inflammation affecting the different tissues of the uterus, is rather to be desired than expected, since every tissue of the uterus is not unfrequently implicated in the same individual.

Symptoms.—The symptoms of puerperal fever must be viewed collectively not individually, neither is the presence of any single symptom necessary to constitute the disease. Severe and protracted after-pains, even in the case of first labours, a restless night, whiteness of the tongue, and a quick pulse appeared in some cases precursory to the rigor; and in conjunction with after-pains, general feverishness affected many of the women who were delivered at this time.

The symptoms considered in a collective assemblage, though liable to diversity in different cases, both as respects their presence, their degree, and order of appearing, may be described as follows. A sense of chilliness, amounting in some instances to violent rigor, followed by great depression, pain in the sub-pubic region extending to the back, sometimes to the thorax, with anxious breathing, the pain being either fixed, or appearing at intervals, and aggravated by motion. In one instance the pain was attended by tenesmus and slight involuntary evacuations. The abdomen was tender on pressure, soft at the onset of the disease, soon becoming puffy and tense, the distension usually subsiding before death. The face was flushed, thirst was excessive, and the respiration quick. The head was hot, light, sometimes confused, and even painful, but usually clear at the onset of the complaint, and remained so in a few cases throughout its course. In one or two instances the rigor was followed by coma; but in other instances the patient was sensibly alive even to slight impressions. A free and spontaneous perspiration sometimes took place, and usually gave relief.

The sleep was generally disturbed by starts, sighs, or screams. The pulse was sharp, frequent, sometimes full, but usually soft and compressible, and becoming very unsteady with the increase of the disease. A pulse characterized by feebleness, and averaging 120, proved as unfavourable as a more rapid pulse which possessed more firmness. The bowels were torpid, but in a few instances diarrhœa took place, the evacuations being like yeast, and vomiting of a watery fluid was also noticed. The tongue at first moist, clean, and red at the edges, acquired dryness with a tremulous motion, and a rather brown or yellowish fur.

As the disease advanced, there ensued a wildness of manner expressive of pain, and a degree of anxiety accompanied by tumult of speech and loquacity, amounting to incoherence, and the complexion became somewhat sallow.

The urine was high-coloured, but not otherwise altered. In some instances the milk and lochia soon became watery; in other instances one or both of them continued up to the close of life, and the lochia when suppressed every now and then reappeared. Slight deafness was observed in one or two instances to precede recovery.

Symptomatology and Pathological Nature.—Is puerperal fever essentially inflammatory in its character like common peritonitis, and consequently not contagious? Moore very correctly observes, that "the disordered action must precede the change of structure;" and yet the sentiments entertained by Dr Lee, respecting the morbid changes being the effect of inflammation, are perfectly consistent, although opposed by Mr Moore. According to Andral, "an effusion of serum combined with the colouring-matter of the blood, if attended with the symptoms of acute peritonitis, must necessarily be inflammatory."* According to Cusack the disease consists "in local inflammation of a peculiar nature, accompanied by fever of the lowest typhoid description." But typhus is not necessary in order to constitute it. The disease seems to be contagious at its onset, acquiring the inflammatory character in its course; and although we do not recognize all the products common to inflammation, we rarely, if ever, fail in detecting some of them, notwithstanding Moore's statement, that frequently "not a vestige of inflammation is to be detected." The frequency with which the disease is attended with pain, tenderness, fever, serous effusion, and the analogy which the softened tissues of the womb bear to the proper structures of the heart, when affected by acute inflammation, lead us to this conclusion.

---

* Andral by Spillan, p. 199.

I think it must be admitted that we are still imperfectly acquainted with several of the most essential features of the disease. What, for example, does the rigor denote? What period of time intervenes between the reception of the contagion and its full influence? And what connection has the rigor with the serous effusion? It is a popular though a fallacious opinion, that the rigor is the real commencement of the disease. It is rather to be regarded as its consummation. Under no other supposition can we understand the marked prostration which so rapidly succeeds the rigor, or the disadvantage which at such a moment attaches to every plan of treatment. In a few instances, the rigor has clearly arisen some days subsequent to the appearance of very aggravated symptoms; in other instances the patient has been conscious of a mere chilly sensation; and again, as observed by Hulme, "sometimes there is no rigor,"—an observation applicable to one of the fatal cases recorded in this paper.

The opinion, that the disease begins in the blood, and that the cerebral affection is the consequence of this contamination, derives importance from the circumstance, that an extremely rapid circulation has sometimes preceded every other sensible disorder of function. Unfavourable as a very rapid pulse unquestionably is, it does not in reality constitute the most alarming symptom, and in several instances referred to in this paper, the pulse ranged from 130 to 140, and in one case reached 160, and yet this patient recovered. The pulse in puerperal fever is characterized by its frequency, weakness, and compressibility, though in a few of my cases it was more or less full at the beginning. The circulation is early, and in many cases suddenly disturbed, especially when preceded by the rigor. The time at which symptoms of cerebral disturbance appear, is subject to great variation, as they sometimes usher in the disease, or succeed the rigor, and are coeval with the abdominal uneasiness. Early symptoms of derangement of the nervous system, viz. pain in the head, delirium, stupor or incoherence, may either give way or continue as prominent features of the disease throughout its course.* In other instances the faculties are altogether unimpaired, and perhaps it more frequently happens that in the contagious epidemic fever " the sensorium is seldom in any degree disturbed" as mentioned by the late Dr Douglas. I have already stated the case of a lady to whom I was called only two hours previous to her death, whose mental serenity and consciousness of the approach of death was most remarkable. At the close of the disease the affection of the head is an evidence of mere exhaustion.

---

* A late distinguished physician of this town, when attending the wife of a professional friend in consultation, declared his conviction, that I had confounded a sympathetic affection of the abdomen with acute peritonitis. Severe pain and an exquisitely tender state of the abdomen, arising four weeks after an abortion, had been so completely removed by the application of twenty leeches, that in six hours afterwards there was neither tumefaction, pain, nor tenderness; and although there was no return of these symptoms, our patient continued insensible for several days and died. On examination after death the peritoneum was found intensely inflamed, and thick layers of lymph covered both the abdominal and thoracic viscera The brain was *peculiarly firm and healthy.* The case affords a striking illustration of a

Whenever delivery is soon followed by feverishness, the abdomen ought to be promptly examined. If neglected, the gaseous collection will not only interfere with the necessary investigation of the state of the uterus but subject us to the risks incident to delay. The mode of conducting the examination is very material. In peritoneal affections, the hand placed flat upon the abdomen sometimes produces relief after the impression of the moment; but the sudden withdrawal of the hand can scarcely fail to aggravate the distress. In deep-seated inflammation a patient has been rendered comparatively easy by means of a broad bandage, at a time when the disease was approaching a fatal termination. There can be no difficulty in detecting a tender state of the superficial coverings of the womb. It is necessary, however, to move the uterus gently from side to side, in order to obtain the best information relative to its deep-seated tissues. Cusack says it is only by making " pressure with very considerable force that any abdominal tenderness can be detected."

A tumid state of the abdomen, although a frequent, is not a necessary, attendant on puerperal fever. In several cases which terminated fatally, there was scarcely any sensible alteration in this respect; and yet in one of the most formidable cases which I have seen (following *placenta prævia*) the patient recovered, although the abdomen was enormously swollen. Usually, however, as the disease progresses, we find more or less swelling, from mere puffiness to absolute tympany, and as a general rule the tension, which appears subsequent to the subsidence of pain, is to be regarded as indicating the greatest danger. But, in the words of Andral, " tension may disappear, and yet the disease continue in full force."* Usually the effused fluid cannot be made to fluctuate, though I once succeeded in ascertaining the existence of fluctuation very distinctly.

Andral, in commenting upon a case of peritonitis, observes, " fluctuation was felt in the abdomen, and the evidence of this fluctuation was itself a remarkable circumstance; for it generally happens that during the first days of the existence of peritonitis, the abdominal effusions being but inconsiderable, may be rather re-

---

remark made by Andral, that " peritoneal pain disappears very rapidly without being accompained by any perceptible abatement of the other symptoms."

* Andral, by Spillan, p. 993.

cognized by the tension and resistance of the parietes, the change in the form of the abdomen, than by any great increase in its size, or by the existence of fluctuation."—Andral, p. 996.

It might have been supposed that a disease of so active a character would necessarily have been attended with pain and tenderness; but this was by no means the case; although the peritoneum had participated in the mischief in several instances of deep-seated inflammation, the tenderness scarcely exceeded what is common to a recent delivery. Undoubtedly pain is common to the disease during some part of its course. In two instances in this paper, the pain was trifling during the early stages, but was renewed very intensely before death. Several women who could lie fully extended were frequently discovered with their knees drawn up, and yet these persons would not allow that the posture was selected on account of actual pain. In cases of inflammation again the pain may come on periodically like after-pains, occasioned, I conclude, by the contractions of the womb upon parts already in a state of inflammation. Andral, in commenting on a case of acute *metritis*, and the necroscopic appearances, arrives at the following conclusion, which is equally applicable to cases of puerperal fever. "What was very remarkable and deserving the attention of every practitioner, was that at the very time that the fever was declining, and the hypogastric and inguinal pain was disappearing, the uterus was becoming disorganized, its tissue was filling with purulent matter, and towards the tenth day since the invasion of the metritis, this matter was already forming several abscesses. It is not uncommon to see the formation of purulent matter in different organs, with a marked remission of the worst symptoms."—Andral, p. 997.

Tenderness of the abdomen even to an extreme degree may occur after delivery, as a mere neuralgic affection; but this it is scarcely possible to confound with inflammation. Tenderness of the abdomen, conjoined with feverishness and a slight chill following uterine hemorrhage, gives way very decidedly to a full opiate, fifteen or twenty grains of Dover's powder, fomentations, and the hot-bath. The pathology of the state is not perfectly clear, but I suppose it consists in congestion or very mild inflammation.

Inflammation of the uterus is not incompatible with the secretion both of milk and lochia. In simple peritonitis, both secretions for the most part cease, or very greatly diminish in quantity, especially the lacteal; but to this there are marked exceptions. In these cases of puerperal fever, the presence of the lochia was by no means an invariable concomitant; for although both secretions proceeded in full activity, especially the lochia, the contrary was also observed. The exceptions were sufficiently frequent to invalidate the doctrine, that the unchanged state of the lochia can be regarded as pathognomonic of the disease.

Professor Hamilton lays much stress upon the fetid character of the lochia in puerperal fever. Deferring, as I do, to the authority of this experienced practitioner, I cannot say that this symptom was at all conclusive in my own cases. This morbid state of the lochia may be supposed to apply in a peculiar sense to puerperal fever of a decidedly typhoid kind.

In the epidemic before-mentioned, the mucous coat of the stomach and intestines participated less actively in the existing disease than might have been supposed. Vomiting, however, sometimes came on in the course of the disorder, either from sympathy, or as an evidence of exhaustion. The intestinal functions were characterized by torpidity rather than excitement.

As the alternation between urgent vomiting and diarrhœa is in some instances very marked, and as the latter is far less exhausting than the former, and more easily controlled, great caution should be exercised not to restrain the diarrhœa too suddenly, lest the vomiting be immediately reproduced. The extension of inflammation to the venous system is sometimes attended by very obstinate diarrhœa.

Morbid Anatomy.—The appearances, as exhibited after death in the eight cases examined, differed from the common acute form of peritonitis, in leaving fewer traces of morbid products, and in the non-adhesion of parts by coagulable lymph. With a single exception there was no appearance of false membrane, or flakes of very soft lymph floating in the effused serum—a circumstance altogether referable to the character of the attack, and not to its duration. In the case excepted, the deposition of lymph was moderately consistent, but in no respect organized or adhering.

The appearance of the peritoneum was far from uniform. In one instance the membrane lining the abdominal muscles was very brightly injected with elevations like millet seeds; in a second it had a pale appearance; and in a third it presented numerous elevations like blisters. In one of these the uterus exhibited the soft pultaceous character, having a brown hue in place of its firm and healthy structure, and in common with the viscera of the abdomen generally, it was in several instances coated with very soft lymph, an exceedingly soft exudation, more like consistent purulent matter or thin custard, than lymph. In two instances this appearance was entirely wanting.

The serum varied in its character from a pale to a brownish colour, and also a pink colour, like the colouring matter of the blood. Unlike the other effusions, the deposition of the pink colour was very trifling in amount. Purulent formations of a white creamy kind were found in three instances; the first in the great blood-vessels; in the second in very large quantity in the cellular tissue between the bladder and rectum; in a third, in the absorbent vessels, which lay directly underneath the peritoneal covering. These vessels contained a substance precisely resembling the soft custard deposit which covered the serous membrane generally. It was remarked by several gentlemen present, that, with this exception, the uterus was particularly healthy. Secondary purulent collections have not unfrequently been found in organs remote from the uterus, and even in the joints.

The formation of purulent matter, and its final discharge through the umbilicus, is peculiar to the common form of peritonitis. A very striking case of this kind, ending favourably, was mentioned to me very recently. In one of these cases of puerperal fever, a very large, hard, and painful swelling formed over the *symphysis pubis*, and although the inflammation had extended to the integuments, the contents of the tumour slowly disappeared, and the patient recovered.

Treatment.—The importance of treating the common acute form of peritonitis by active depletion is universally acknowledged; but how do these principles apply to epidemics? Under the treatment adapted for typhoid states, both Hey and Gordon lost almost all their patients, whilst under the vigorous depleting system, the result was most auspicious. Twenty-three of Dr Gordon's first twenty-seven cases treated by stimulants died; but of the remaining fifty cases treated by bleeding, he saved all excepting five. Armstrong under a similar treatment lost only five out of forty-three. Hey saved only three out of thirteen, until he adopted the practice of early and active blood-letting, when he lost only two out of thirty-six. These are facts which do not admit of question; and yet in other epidemics implicating the same tissue, a similar treatment may be destructive to life. What, then, do we infer from the contrast? Simply that the essential nature of puerperal epidemics must be very different; a difference calculated to exert an important influence over our practice. In one respect the treatment of every form of uterine inflammation, which rapidly follows delivery, may be considered peculiar in kind, and should have reference to the process of reparation, which scarcely terminates at the end of the fourth week; and the earlier the attack sets in, the less power will there be to resist large and frequent abstractions of blood. The erysipelatous form of puerperal fever seems to be more dangerous than any other, and, in common with ileus affecting the muscular coat of the intestine, seldom gives way to bleeding.

The removal of severe after-pain becomes an object of moment, lest it should pass insensibly into pain of a more important character. For this purpose a warm turpentine injection, a full dose of Dover's powder, or a combination of camphor and opium, may be resorted to. The earliest measures have too frequently failed to arrest the progress of puerperal fever. A practitioner who had lost several patients, was on the alert watching the first moments of attack in others, but with no better result. Still the advantage of acting early is obvious, whenever the disease prevails. An injunction should be left with the nurse instantly to communicate with the practitioner on the accession of pain, rigor, or other suspicious symptom, and a calomel antimonial powder should be in readiness. Full vomiting would scarcely be hurtful at the onset of the attack. Indeed Mr Barlow of Blackburn assured me of the admirable effect of Doulcets' plan in his own long and very extensive practice.

In epidemics of this character, the words of Kirkland, in respect to bleeding, seem peculiarly applicable. "Those who have taken away blood in similar cases have observed, that the patient has often become worse after once bleeding; that many have recovered where the lancet has not been used, but few who have lost much by it."—On Child-bed Fever, p. 142.

General blood-letting was enforced in the cases already described under circumstances apparently very favourable. Not only was the blood drawn very early but freely, and in persons of fine healthy constitution. In one of these instances the practitioner, with the view of giving a decided check to the attack, bled the patient to a very injudicious extent. Reaction, however, was fully established, and yet the result was soon fatal. In another patient of florid complexion, the disease at its commencement was not severe, but the bleeding did not arrest the symptoms even temporarily. A third lady was bled to fainting as soon as the chill had disappeared, and yet the pulse continued fully as frequent as before, and the symptoms kept increasing to a fatal consummation. Local bleeding was attended with no better effect, and, with one or two exceptions, every patient who was bled died.

The effect of local bleeding by means of leeches in removing pain and tenderness was very marked; but beyond this its remedial influence was questionable, and in some of the cases which occurred last in order, fomentations were substituted, and proved equally beneficial. We may compute with tolerable accuracy the amount of blood a given number of leeches will draw; but the practice of allowing the bleeding to continue for any length of time is objectionable. Unable to estimate the amount of blood which is lost, we risk a declension of the strength, and the application of a blister or other stimuli to the abdomen, however urgent the necessity, is inevitably delayed.

Mercury is said to produce a certain amount of relief antecedent to the system being placed under its specific influence. I cannot concur with Mr Moore in his statement, that "mercury does not possess any power to check the course of the disease." The rapid recovery of several of these patients seemed to be owing to gentle ptyalism being produced; and Ceely says, "nothing but the production of rapid and decided ptyalism afforded the slightest chance for the unfortunate patient." Mr Ceely gave calomel in scruple doses with two and three grains of opium every two or three hours. A combination of calomel with opium and tartarized antimony was resorted to in my cases. It sometimes produced purging and diaphoresis, but the antimony seemed to act principally as a sedative. Three grains scarcely occasioned vomiting. The beneficial agency of mercury in subduing inflammation of serous surfaces in general, and promoting the absorption of the effused fluids, seems to justify its employment in these cases. In *phlebitis* it will aid the absorption of the blood and lymph, and limit, if not altogether prevent, the process of disorganization. In two or three very severe cases, the system was brought under the influence of mercury in two days. We cannot begin the treatment too early, considering the rapid course which the disease usually follows. Opium, conjoined with ipecacuanha, also exerted a very soothing influence, by relieving pain, and reducing the frequency of the pulse. Gordon gave an opiate every night with advantage; but in Mr Hey's cases the effect of opium was unfavourable.

The indispensable necessity of freely promoting the alvine discharge at the onset of this complaint is universally allowed. The bowels, although torpid, yielded without much difficulty to the action of medicine; but an alarming feature in one of the cases was a very obstinate form of vomiting. The case, apparently hopeless, was ushered in by two severe rigors, confusion of the senses, and abdominal pain and tenderness. The pulse reached 160. The disease seemed to defy every means of relief, and the stomach had for two or three days instantly rejected both food and medicine. Almost in despair two drops of hydrocyanic acid were administered in an ounce of plain cinnamon-water, and had the effect of soon quieting this irritable state of the stomach; and although a large hard tumour formed in the groin, the patient recovered; but a considerable time elapsed ere the tumour had wholly disappeared.

The oil of turpentine was not given in any one of these cases, although Cusack and others consider it as well adapted for this form of the disease. External irritants were of very little avail. These consisted of blisters, the oil of turpentine mixed with soap liniment, and the camphor liniment containing mercurial ointment, a piece of flannel being moistened with the liquid, and laid over the abdomen. Enemata, composed of infusion of chamomile and a small quantity of the oil of turpentine, act beneficially by dispelling the large collections of flatus, and relieving the pain which the distension occasions.

Whenever fœtor of the lochia prevails, the employment of the yeast and water injections, or the chlorides properly diluted, will be found most important auxiliaries.

When the bandage does not evidently occasion inconvenience, (as in active peritonitis) its removal, except for the purpose of leeching the abdomen, is not always advantageous. The support is suddenly withdrawn, and the gaseous collection increases in common with the increase of pain. A broad flannel bandage affords an even support, and permits the free use of the dry fomentations, which are equally soothing, and far more convenient than the liquid fomentations so generally used.

Fomentations had the effect not only of relieving pain but facilitating the diaphoretic action of medicine. As it is desirable that the heat should be applied to the whole lower half of the body, flannel bags from 10 to 12 inches long and 4 to 6 broad, partially filled with heated chamomile flowers, should be placed underneath the loins and over the abdomen, in order to surround the affected strictures, while a small bag may be laid over the vulva to promote the lochia, when defective. As a moderate degree of heat should be constantly maintained, a relay of bags must be in readiness. Chamomile flowers, by their lightness and dryness, seem better adapted to this purpose than bran, salt, or any of the substances which are usually employed.

It was proposed, in 1813, by Dr Sutton, to apply a high degree of cold to the abdomen in cases of inflammation of the peritoneum; but, from its liability to reproduce the chill and its consequences, the remedy seems scarcely suitable in the early stages of puerperal fever. When limited to the head, tepid evaporating lotions seem preferable to a high degree of cold. Although I have seldom treated puerperal fever by cold remedies, the evidence of two gentlemen in favour of this treatment must not be overlooked. Mr Ceely observes that, in the Aylesbury epidemic, the effect of cold evaporating lotions applied to the loins, abdomen, and vulva, alleviated pain, repressed tympany, and proved more grateful to the patients than fomentations.

The treatment by ice, internally and externally, seems to have been successfully adopted by Dr Michaelis in the Lying-in Hospital at Kiel.

" A piece of ice of about the size of a finger was given to the patient every half or quarter of an hour," and " externally a very large bullock's bladder, partially filled with ice or snow, was laid over the abdomen." The effect of the ice is here stated to have been very grateful to the patients, producing sleep,—a diminution in the frequency of the pulse,—cessation of vomiting, and return of peristaltic action. Dr Michaelis believes that the ice also causes absorption of the abdominal effusion. If this account is not overstated, the remedy is of incalculable value. It certainly merits a more extended trial. A simple unirritating diet, especially milk, is more adapted to the state of the stomach than stimulants.

The employment of cold applications was adopted in two cases only.

In the first case, the disease set in two or three days after the patient's delivery;—at least on the third day, (being Wednesday,) the practitioner observed that the pulse averaged 160, and without any obvious cause, there being neither pain, tenderness, rigor, nor any obvious symptoms; slight thirst and heat of skin perhaps excepted. Thursday and Friday there was no very marked change. I visited the case on Saturday morning. The abdomen was now much swollen and puffy. I thought I could discover fluctuation. There was neither pain nor tenderness; the head was quite clear; the milk and lochia actively secreted; vomiting had taken place two or three times. The alvine evacuations (produced by medicine) had the appearance of yeast; the respiration was quick; the pulse was 160. The urine had for some days previously been taken away by the use of the catheter. On Sunday violent pains took place nearly in the region of the right kidney. On Monday the complexion had become sallow, and there was a considerable degree of subsultus. Mercury had been liberally employed, but the system could not be brought at all under its influence. Cold applications and the administration of ice by the mouth were tried, only, however, a few hours before death, and at a time when no treatment could have availed. She died on the Tuesday morning early.

In the second case the treatment by cold was adopted at a less advanced period of the disease. In less than two hours after delivery, the patient was seized with violent and *unremitting* pain in the abdomen, attended with chilliness, and at the end of fourteen hours the abdominal tenderness was very marked. She was then bled from the arm with apparent relief. The pain returned at the close of the second day, and extended to the left hypochondrium and back. I was called in on the third morning. The pulse did not exceed 100; the respiration was quick; the milk and lochia were actively secreted; the head was quite collected, and free from uneasiness; the tongue was slightly furred; and the abdomen was puffy but not tender. Calomel in scruple doses was prescribed, with two grains of Dover powder, and a blister was applied to the chest. The following day the pulse had become much quicker, and the abdomen was painful, more swollen, and very tender. Cold water was now applied to the abdomen by means of a large and partially collapsed bladder, and continued unremittingly during four days, not only with advantage, but to the great relief of the patient. The cold had a marked effect in allaying pain, and in proportion as the temperature increased, so did the pain return; a circumstance by which the renewal of the cold was regulated. The patient assured me that she did not think (to use her own words) she "could do at all" without the cold. The mouth became sore by the mercury. She perfectly recovered.

In reference to the *modus operandi* of cold in this disease, it seems not only calculated to restrain an inordinate action in the vessels, but to diminish their calibre as well as to promote the absorption of the effused fluids.

It is worthy of remark, that these two cases occurred at the same time, and the patients resided within a few doors of each other. The subject of the second case was attended by a practitioner who, a few hours previously, had been dressing a very extensive erysipelatous disease treated by long incision. I state this on his own authority.

Mr Cusack sanctions the employment of wine. Puerperal fever connected with a typhoid state will doubtless demand the stimulant and cordial treatment.

Art. VI.—*A Selection of Cases presenting aggravated and irregular forms of Hysteria, and an Analysis of their Phenomena. No.* II. *containing,*—1. *Hysterical Hemorrhages.* 2. *Hysterical Nervous Affections.* 3. *Part of the Analysis.* By Thomas Laycock, House Surgeon to the York County Hospital.

In a previous paper I gave the details of cases of hysteria, the most prominent symptom of which was a long-continued retention or suppression of urine, accompanied in some by an erratic discharge of that fluid.

I thought I had noticed all the cases of this class worthy of mention. I find, however, that I have omitted a case related by Dr Tickner of New York, in the American Journal of the Medical Sciences for May 1834. It is more extraordinary than any I have yet read, and has some resemblance to Dr Konig's, (No. 3.) The patient, a female, is reported to have suffered from discharges of urine, and of great quantities of sand and calculi from the mouth, rectum, nose, ear, a wound on the side, and the umbilicus. These symptoms were accompanied with paralysis, tetanus, &c.*

In pursuance of my original plan I shall now proceed to detail cases illustrative of the hemorrhages and extraordinary nervous affections to which females are liable. Instances of these are comprised in the preceding paper. I shall then attempt an analysis of the phenomena of the whole of the series.

SECOND CLASS.—HYSTERICAL HEMORRHAGES.

This class having little of the marvellous, and being by no means rare, introductory comment is unnecessary.

29. *General Hemorrhages.*—Isabella Robinson, when aged 15 years, had the catamenia twice. While menstruating for the third time, she was thrown violently on a stone. Her left shoulder

---

* 28. Lond. Med. Gazette, Vol. xiv. p. 539.

was hurt, and she vomited a large quantity of blood. The next day the menses were suppressed; the injured shoulder and side were very painful, and she had hæmatemesis and epistaxis. These last continued to a large amount daily for two years. Sometimes hemorrhage would take place from the ears. During the next four years she bled from the mouth, nose, eyes, and ears, at short intervals; and from the uterus occasionally. In the sixth year, cupping glasses were applied to the back, and the hemorrhage was arrested for seven weeks. Pain and tumefaction of the breast followed, so that she was obliged to be scarified a little below the ensiform cartilage. In the eighth year she was greatly distressed with a suppression of urine for eight or ten days, and with bloody urine. In subsequent years blood flowed from the mammæ, and the roots of the nails of both fingers and toes, and the patient was in the habit of being bled for the purpose of arresting the hemorrhage from these various sources. Mr Murray, the relator of the case, had bled her, and the blood was invariably no higher coloured, nor of thicker consistence than water in which flesh had been washed. The effused blood was similar. The history was communicated to the Edinburgh Society during the lifetime of the patient, and its members were invited to verify the facts by their own observation.

30. *Sanguineous Ephidrosis.*—A female, aged 10 years, was treated successfully with mercury and decoction of woods, for a supposed syphilitic affection. Nine months afterwards, she experienced an unpleasant tension of the right arm, which was followed by an eruption of pustules, and pricking pains in the latter. Shortly after, pure blood flowed from them, and they, as well as all painful sensations, forthwith disappeared. The same train of symptoms recurred at two successive monthly periods. The patient was bled from the foot, and emmenagogues were administered, with the effect of checking the hemorrhage from the arm, and inducing regular menstruation. If the fingers of the right hand were exposed to cold, blood still trickled from the roots of the nails. No fissure or mark could be discovered from which it might flow. By suitable remedies this was removed, and the patient continued well for four months. Blood then began to distil from the surface of the right hand fingers, recurring every or every other day. Her face then became suffused, the head affected with vertigo, the larynx swollen, and she experienced a kind of hysteric suffocation. The symptoms disappeared on the breaking out of a bloody sweat on the neck. The right hypochondrium then became tumid and painful; the tumefaction of the larynx, and the accompanying symptoms returned; and blood flowed from the nose, neck, right arm, and calf of the right leg; at the same time the whole of the right side was affected with spasms. Afterwards, the eyes, lips, neck, hands, and knees, were alternately convulsed, and the abdomen swelled. On the cessation of these symptoms, the left arm and leg were found in a state of tetanic flexion, and the right eye was amaurotic.

The use of various remedies restored motion to the arm; but the leg and eye were unrelieved, and the abdomen remained tumid. Subsequently blood flowed from the left eye without restoring vision, then from the skin on the left side of the nose, from the nostrils, the ends of the right-hand fingers, and the ulnar side of the right arm. The history of this case, in the handwriting of Boerhaave, was found in his desk after his death. The termination is not given. Various means were used with little success.

31. An irritable woman, of a sanguine temperament, regularly menstruating, was seized at the age of 25, with convulsions, recurring upon any painful affection of the mind. Whenever the mental disturbance did not excite nervous symptoms, it was invariably followed by considerable hæmoptysis and convulsive cough. Two years after the first seizure, she was attacked with severe pain in the region of the left kidney in consequence of a fit of anger. The abdomen became so painful that the usual coverings were intolerable. Violent vomiting repeatedly came on. The urine was clear and scanty during the paroxysm, which lasted twelve hours; but a few days after it was loaded with much red sandy matter.

This colic, invariably originating in a moral cause, frequently recurred during two years. At the end of that time she had a paroxysm unusually long and painful, and accompanied by a very unpleasant itching. The patient was now alarmed by the appearance of large spots of blood upon the handkerchief with which she had been wiping her face. The physician in attendance observed, that drops of blood exuded everywhere from the skin, and that this phenomenon occurred when the pain and vomiting were most violent. Opium every hour relieved all the symptoms, and the skin only presented small spots of a yellow colour, which soon disappeared. The last paroxysm took place without obvious cause, and the perspiration of blood was confined to the face, neck, arm-pits, and anterior part of the thorax and abdomen. The blood drawn during one of these paroxysms formed into a firm coagulum.

32. A young woman, aged 21 years, irregular in menstruation, and of indolent habits and obstinate temper, had been much irritated by some remarks of her parents. She left her home in consequence; and after wandering about for some time entered an hospital. She was then suffering from violent attacks of hysteria, attended with general convulsions, and exquisite sensibility in the pubic and hypogastric regions. After paroxysms, which sometimes lasted twenty-four or thirty-six hours, she fell into a kind of ecstacy, her eyes being fixed, and sensibility and motion suspended. Sometimes she muttered a prayer, and blood would exude in drops from the cheeks and epigastrium, in the form of perspiration. The cutaneous surface appeared injected in those parts whence the blood escaped, being red, and showing a net-work of arborescent vessels. This phenomenon occurred in every unusually long paroxysm. The disease gave way in three months to local bleedings about the head and sexual organs, and strong revulsive measures.

33. *Hæmoptysis.*—A female unmarried, aged 27 years, began to

menstruate when eleven, and had always suffered from dysmenorrhœa, and frequently from amenorrhœa and profuse leucorrhœa. Eleven weeks previous to her admission into Guy's Hospital, being in the fourth month of pregnancy, she was violently kicked and struck on the chest, back, and stomach. She vomited a pint of blood, and was insensible for three days, during which abortion took place. She subsequently suffered from acute pains in the back, loins, abdomen, and left side, dyspnœa, occasional cough, and much bloody expectoration.' This having been so recently published I shall only give a list of the symptoms. At the time of her admission into the hospital she had aphonia, distressing difficulty of breathing, which was accompanied by a loud sonorous noise; scanty expectoration tinged with blood; pulse 84; severe pain under the left mamma, in the back, loins, and left side of abdomen. The pressing symptoms were relieved by a blister, ether draught, and the application of leeches to the throat. At each menstrual period she had some of, or all the following symptoms:—Epistaxis, relaxation of the uvula, hæmoptysis; pain in passing stool or urine; paralysis of the bladder; tympanitic painful swelling of the abdomen; diarrhœa, constipation, and dark scybalous stools; extreme tenderness of the *os uteri*; hysterical paroxysms; cephalæa, stupor, delirium; pains in the back and other parts already mentioned, and spasm of the right upper extremity. She at last menstruated copiously under the use of leeches to the cervix of the uterus, hydrocyanic acid, galbanum pills, and pills of aloes with myrrh; and all the symptoms disappeared.

34. Mary Vaux, aged 20 years, a short stout-made girl, with round full face, and rather fair complexion, was admitted into the York County Hospital under the care of Mr Russell, on September 7th last. She had tumour and a fistulous opening near the left ear in the region of the parotid gland, enlarged tonsils, slight deafness, amenorrhœa, and spinal tenderness in the dorsal region. The muscles of the back and the angles of the ribs were equally as tender on pressure as the spinous processes of the vertebræ. The urine in one day amounted to a few ounces, and the bowels were constipated. Ten months previously she had walked nine miles, stood in the street to be hired as a servant, and walked nine miles back, all on a wet and cold Martinmas day, while menstruating. During that day she lost her voice, and on the following the menses were suppressed, and she had pain under the left breast. Her legs then swelled, the left arm was spasmodically flexed on the chest, and the leg on the thigh. This spasm continued until the next menstrual period, when it subsided, but she found that she had lost all power over the two extremities. At the time the spasmodic flexion came on, her heart began to palpitate violently, she had a violent spasmodic cough with a loud barking noise, a feeling of irritation at the junction of the neck and chest, scanty expectoration, and frequently of blood. Her bowels became constipated, and the abdomen tumid and tender, she passed little urine, at one time not any

for three days, and then it was mixed with blood. There was occasional aphonia. Animal food, but beef in particular, disagreed with her, and for several months after the attack she eat very little animal food. In three or four months her tonsils became enlarged, and a tumour formed near the ear, in consequence, as she imagined, of the excessive straining caused by the cough. This last became much less violent when the tumour suppurated. A variety of remedies have been employed, and she is now, four months after admission, considerably relieved. The tonsils are still large, the back tender, and the catamenia absent. The iodide of potassium seems to have been most useful.

35. The cases of *ganglionic* and *spinal irritation*, published by Mr Torbet in the 44th volume of this Journal, are very interesting. One of them is a well-marked case of hysterical hæmoptysis; and on this account, as also because it presents a sort of epitome of the varied symptoms of hysteria, I shall mention very briefly its most remarkable particulars. I may refer to it again.

The patient was a young lady of precocious growth, aged 15 years. The history embraces a period of four years. An attack of typhous fever followed a cough and hoarseness, and was itself succeeded by an apparently inflammatory affection of the hip-joint. Next palpitation of the heart, dyspnœa and cough, caused a suspicion of *carditis*, and she was consequently bled freely, and treated on an active antiphlogistic plan. We find, however, some months after, that there was still palpitation, a harsh ringing cough, and sensation of suffocation at the junction of the neck and chest. Between fifty and sixty ounces of blood were then taken from the arm in six days at four bleedings; and the symptoms were retching, a hollow barking dry cough, quite *sui generis;* quick and easily excited pulse; fits of cephalæa, ending in violent retching without the ejection of any thing from the stomach; spinal tenderness; toothache; headach; and retchings in succession; an alternation of toothache and cough, and of retching and headach with each other; next palpitation of the heart, and then hæmoptysis continuing through several months to the termination of the case. The hemorrhage seemed at last to be vicarious. Sometimes coagulated blood was expectorated, sometimes a fluid like serum coloured red. Connected with this symptom, we find diarrhœa, a most incessant cough, difficult to number, vomiting of blood, and paroxysms of throbbing headach, incessant retching, and violent spasms of the abdominal muscles, occurring apparently every or every other evening at eleven o'clock. The feculent discharges are described as being enormously large. A new symptom next appeared. The patient fell into a trance-like or cataleptic state, and toothache, headach, and pains in the hip and knee, hæmoptysis, and all the other symptoms disappeared, but recurred on the cessation of the trance-like condition. Convulsive contractions of the neck and extremities; sobbing and weeping; dysphagia, and involuntary micturition followed, and, as if the sufferings of the poor patient were not great enough, she experienced total blindness and deafness. Her perceptions by the touch while in this state were, however, remarkably acute. "By a kind of instinct" she seemed to distinguish the individuality of each person. She more than once fell into a hysterical sobbing when a person she did not choose persisted in offering her drink. Shortly after this deprivation she began to suffer from frequent fits of syncope and incessant yawning, and after the restoration of her hearing, and the sight of her right eye, anæsthesia, and paralysis of the extremities came on. Her various nervous affections subsequently seemed to intermit, as she had her good and bad days. On the good days, in spite of her long continued sufferings and the active depletion practised, she had the appearance of a person in good health. After being in the country for three or four months she was much better, all the symptoms being ameliorated. She became able to drive out twice a day, four miles each time, and eat and slept like other people.

This case altogether is very remarkable. It illustrates well the metastatic nature of these affections, and the tenacity of life which the subjects of them possess.

36. *Hæmatemesis.*—Elizabeth Camidge, aged 18 years, was admitted into the York County Hospital, on June 23, 1836, under the care of Mr Champney, as a case of diseased knee-joint. She complained of pain in the right hip and knee, darting from her back, through her hip and down her thigh to the knee. The loins and knee were tender on pressure. The tongue dry, pulse much quickened. She appeared of spare habit, rather below the middle size, had a wide pelvis, waddling gait, darkish hair and eyes, and white teeth. She menstruated for the first time when aged about seventeen. When the catamenia were flowing for the third time, she was much alarmed by falling down some steps, and they were immediately suppressed. At the next menstrual period the menses were absent, but she vomited blood. This circumstance frequently occurred during the subsequent twelve months. Small mouthfuls of a bloody fluid used frequently to rise into her mouth, without any kind of convulsive effort or attempt to vomit. The catamenia appeared occasionally during this period, but at the end of it disappeared altogether, and were replaced for a long time by a monthly vomiting or rather expectoration of blood. This was not quite regular in its periods; however, sometimes it occurred twice or three times together at intervals of three weeks, and in the intervening time mouthfuls of the bloody water used to be brought upward. Shortly after the accident above-mentioned, a loud barking cough came on, almost constantly teasing her; the abdomen frequently became tumid, tight and painful, and so tender on pressure that she could not bear to wear her stays. She sometimes passed no urine for three or four days together. Her heart then began to palpitate violently on the least exertion, the blood-coloured fluid frequently rose into her mouth, and she had frequent fainting fits, lasting for a few minutes. Profuse sweats used to break out, so that her sheets and shift became as wet by them as if dipped in water. She usually slept

very little, and for three or four months in succession. She was awoke from her sleep every morning about one o'clock, by a most violent pain and palpitation of the heart. She awoke always in great alarm and trembled violently. Her back was so tender that she could scarcely bear a string to be tied round her, and was not able to stand upright. She had constipation and pain in the right hypochondriac and iliac regions. With regard to the knee, it was injured at the time of the accident, and swelled very much. For several months subsequently she was under treatment for it, blisters, leeches, &c. being applied.

The various symptoms now mentioned appeared gradually during the twelve months intervening between the date of the accident and that of her admission into the hospital, and gradually increased in intensity. Soon after admission I observed that she sweated profusely, and that her linen was soaking wet, and this almost constantly. She complained of severe palpitation, and when most severe of distressing dyspnœa. The action of the heart was exceedingly tumultuous, and from 115 to 155 strokes were made in a minute. Occasionally the fingers and thumb of the right hand became of a livid colour, mottled with dusky red spots, and this state was accompanied by an aching pain along the arm. Spirituous lotions relieved this symptom. The pain in the hip and lumbar region, the cardialgia and palpitation resisted every remedy. At the recommendation of Drs Wake and Belcombe, local bleeding by leeches, digitalis, iron, quinine, opium, and the local application of veratria, were used with very little effect. Opium, perhaps, was the most efficient; its utility, however, was not well-marked. The tongue presented a remarkable appearance. It had begun to feel dry in April preceding her admission; it was now perfectly dry, and of a mahogany colour over its whole surface, except a small strip on each side. Very little saliva was secreted, and the thirst was urgent. Two months after admission, the tenderness was found to extend along the whole spine, and the sides of the trunk. The urinary secretion was suspended for three days; the catheter was then introduced regularly for a week, and an ounce or two of urine drawn off occasionally. After having remained in the hospital four months, she was discharged somewhat relieved. During the whole of this time, although suffering from such profuse perspiration, she was not at all emaciated, her arms and legs were round and fat, and the mammæ full and firm.

She was readmitted on the 4th March last. Little alteration had taken place during her absence. On the 8th, being the catamenial period, as usual she vomited, or rather three or four ounces of frothy blood rose into her mouth from her throat. I made particular inquiries, but could never learn anything to support the opinion that it came from the stomach. In a day or two the whole of the right hand became of a purple colour, and a deep red blush covered the fore-arm. These appearances were accompanied by considerable pain and smarting. The perspirations were incredibly profuse; the pulse 144 per minute, each stroke giving a wavy sensation to the finger as if one was prolonged into another. The action of the heart was very distinct and forcible, but no anormal sound could at any time be detected. Dyspnœa was very distressing, with acute pain under the left mamma. I now learnt that she could take no other food than bread and beer, or potatoes and milk. She complained that animal food, and especially beef, as soon as eaten, caused a queer sharp pain about the heart, and a sensation as if she were going to die.

During the following three weeks the pulse ranged between 130 and 160 per minute. She complained of giddiness, cephalaea, cardialgia, and sleeplessness. The perspiration stood in large beads on her face, and it was so profuse over the whole surface that her bed and body linen would be literally as wet as if just taken out of water. On the 27th she complained of blood rising into her mouth like flatus. This happened when she was asleep, for on awaking, she has found her lips and tongue crusted with blood. In the beginning of April the tonsils were observed to be very large, and during the whole of this month she frequently vomited blood. The pulse on one occasion fell to 92 per minute. At that time she suffered acute pain in the right hypochondrium, as if a knife were being thrust into it; and pain in the region of the spleen; with suffusion of the face and rigors. From May to August, in addition to the constant features of her disease, cardialgia, sleeplessness, rapid pulse, and sweats. The urine was scanty and pale; the abdomen tumid and tympanitic; alternate sweats and diarrhœa; great anorexia. Sometimes the merest morsel of bread only being eaten for two days; unconquerable dislike of animal food; frequent syncopes accompanied by a sensation of choking and severe pain under the left mamma, and great tenderness of the surface of the whole body; the tonsils were very much enlarged; the tongue dry and brown, as if in the last stage of continued fever. Indeed, those medical gentlemen who have seen the case, and judged only from the pulse and tongue, were invariably of opinion that she was in a high fever. She was sent into the country on August 24th, and for some time was very much better. On returning to her home at York, (her parents are very poor,) all the former symptoms, however, returned, and she was admitted into the Hospital for the third time under the care of Dr Belcombe. on October 2d last. At the present date she is certainly better. There is no spinal tenderness; no blood is poured into the mouth; she sweats less profusely; rarely faints, and can eat mutton or veal. But she sleeps little, has violent palpitation, especially at night, the urine is scanty, the tongue quite dry and brown, and the tonsils are large.

It would be perfectly useless to specify the remedial means adopted. A list of the names only would be very tedious. She once lost five ounces of blood, when she fainted, and all the symptoms were obviously aggravated. The coagulum was florid, gelatinous, and with only a few drops of serum. Local bleedings generally relieved for a time, but of all the remedies warm baths appear to have been most useful. She remained in them an hour or two. Four or five grains of opium taken in twenty-four hours had no apparent effect.

The general appearance of the patient is unaltered. There is no emaciation; the mammæ are prominent and firm; the nipple prominent, but rather small in circumference, and surrounded by a brown areola of about three-fourths of an inch in diameter.

It would not be difficult to multiply cases resembling these. Taken in conjunction, however, with several in the first class, they are amply sufficient to give a clear idea of *hysterical hemorrhage*, and of the character of its concomitant symptoms, whatever form it may assume.

THIRD CLASS.—HYSTERICAL NERVOUS AFFECTIONS.

This class presents an almost infinite variety of extraordinary maladies, which have been commonly named from some symptom more prominent than the rest. Thus nosologists speak of *hysterical* somnambulism, tetanus, aphonia, dysphagia, vomiting, &c. This plan I have already adopted in naming the affections combined in the first and second classes, and shall follow it also in this. I shall begin with the more simple affections, and proceed to the more complicated.

37. *Neuralgia of the Mamma.*—A girl, aged 25 years, of fair and very florid complexion, has pain just under the bosom, which extends to the shoulder, arm, and even to the elbow and hand; it ascends to the neck and descends to the hip. She menstruates regularly, the bowels are costive, and she has great pain in the loins. Her breasts occasionally swell, and she has great pain in them just prior to menstruation.

38. A woman had two small tumours under the breast, moveable under the skin, and about the size of small peas, which made their appearance at different times after a blow on the chest. The first occasioned no inconvenience, but the appearance of the second was followed by symptoms of severe hysteria. She applied at La Charité, and M. Boyer extirpated the tumour which formed last, and completely relieved the patient from her sufferings.

39. *Ecchymosis of the Mamma.*—A young lady, aged 17 years, has a bruised appearance of the breast; there is one larger and several smaller extravasations like those which leeches, had they been applied, would have produced under the skin. This extravasation of blood, to which she has been repeatedly liable, begins about a week before, and disappears a week after menstruation. Before the blood is effused, she suffers severe pain in the bosom and arm. The menstruation is irregular, occurring at distant and uncertain intervals, and then profusely.

40. Miss G. aged 21, has very large breasts, is corpulent and phlegmatic, subject to nausea, and has a very bad appetite. The bowels costive, and menstruation irregular. She has the appearance of a bruise on the right breast, which is exquisitely tender to the touch,

and the seat of great pain, extending along the inner side of the arm to the ends of the fingers.

41. *Hemorrhage from the Mammæ.*—A woman, 24 years old, had enjoyed a very good state of health, except that she was frequently subject to bleedings from the nose, and determinations of blood to the head and chest. She married at the age of 14, and menstruated the following year for the first time. The periods recurred regularly, but at each she always suffered considerable pain in the abdomen. At the age of 17, she became pregnant, and menstruated in the first and second, and sixth and seventh months of pregnancy, and again two months after her confinement, although suckling her babe. At this time her mind was much disturbed, and she experienced an attack of severe illness, during the first three or four days of which blood exuded from the nails of both hands and from her gums. She suckled for two years, the menses being regular. When she weaned the child, the milk continued to flow freely and constantly from the breasts, without any injury to her health; the breasts remaining soft, and the menses regular. If the secretion of milk ceased for a short time, she experienced pain and tension in the breast. She gave milk to children whenever she had opportunity, and continued in this state for six years, when a physician attempted to cure her by bleeding her at short intervals from both arms, the forehead, and from behind the ears. He arrested the lactation, but in its place a discharge of blood took place from both breasts with violent pains extending to the shoulder and neck. It was of a dark colour, fetid smell, and tinged the linen of a deep red colour. The health remained unaffected when free from pain, for the breasts were so tender that the slightest touch was insupportable. Menstruation made no difference. During either rainy or cold weather, the discharge diminished, but the patient suffered severely from pains, nausea and vomiting. Hæmatemesis and hæmoptoe used to follow, and she felt speedy relief; but she remained subject to attacks of violent pains and spasms of the stomach, and vomiting on the slightest irregularity of diet, or any mental exertion. The disease resisted every remedy.

42. *Dyspnœa.*—An unmarried female, aged 22, stout, and of plethoric complexion, when aged 14, was first attacked during convalescence from fever with paroxysms of hysteria. These continued to occur until the age of 18, when in addition, she became subject to paroxysms of dyspnœa, when all the muscles employed in respiration were thrown into violent spasmodic action, and she had exactly the manner and appearance of a person who is out of breath from violent exertion. The paroxysm was wont to last two or three days; the patient then became very drowsy, fell asleep, and at length recovered her natural respiration. During the paroxysms the heart beat forcibly, and she had a distressing sense of tightness across the chest. Previously to each, she experienced a sense of sickness, pain at the lower end of the sternum, and voracious and depraved appetite. She generally suffered from pain under the left mamma and across

the abdomen. The bowels were most obstinately confined; the catamenia regular, but painful. These paroxysms and fits of hysteria affected her for four years, and resisted a host of most powerful remedies. She was at last cured by the use of aloetics with croton and castor oils.

43. *Aphonia.*—A young woman, pregnant for the second time, had, from the fifth month of her pregnancy, been frequently the subject of a temporary loss of voice. Previously to each attack, the patient complained of a weight on the breast, and of an uneasiness, and after an hour of a sensation resembling the epileptic aura proceeding from the feet to the neck, and the loss of speech followed. Complete consciousness remaining, and no other function being disturbed, at each attack a vein was opened in the foot with complete relief; the sensation of weight in the breast being first removed, and power of speech immediately following. This attack recurred at intervals of fourteen days, and completely disappeared on delivery.

44. *Aphonia, Barking Cough, Dyspnœa.*—Sarah Uplady, a single woman, aged about 28 years, the mother of one child, was admitted into the York County Hospital, May 26th 1836, having nearly lost her voice, being unable to speak louder than in a whisper. She had also very great difficulty in swallowing, and had a violently spasmodic barking cough. I found that the cough recurred principally in the evening, and was occasionally accompanied by a sensation of imminent suffocation, suffusion of the face, convulsive efforts, a degree of insensibility, and tumefaction of the abdomen. There was great irritability of temper, cephalæa, and the nights were usually sleepless. The tonsils were somewhat enlarged, but no other change about the fauces could be detected, and an œsophagus bougie passed easily along the gullet. She complained of heat and soreness in the throat; but there seemed no greater tenderness than would naturally follow the convulsive efforts made occasionally to swallow and breathe. The mammæ were flabby, the catamenia very irregular, and occasionally profuse. She was in the hospital four months, during which time mercury; counter-irritants; leeching; local sedatives, as opium and belladonna; conium and ipecacuan in combination; and tonics were used, with very little success. Ether relieved the paroxysms, and full doses of the sedative liquor procured sleep. She left the hospital relieved. She had suffered from the same affection during the preceding year.

45. *Convulsive Cough.*—A female, aged 39 years, had been harassed for some time with paroxysms of cough, resembling hooping-cough, occurring in the evening, and especially after eating, and followed by vomiting, dreadful straining, and convulsive agitation. Leeches, purgatives, and other remedies were used unsuccessfully; but the disease was soon cured by anodynes and tonics.

46. *Hoarseness.*—A young female was bled for a catarrh a few hours after the menstrual period had commenced. The catamenia were immediately suppressed, and her voice was lost; a hoarseness

succeeded, which was never removed. This was the third instance of this affection which had occurred in the practice of Dr Cusan.

47. *Incessant Cough, Croupy Respiration, Aphonia.*—A young lady, after a walk in her garden during a damp and cold day, was seized with such difficulty of breathing and incessant cough, that her medical attendant supposed there was laryngeal inflammation, and immediately bled her, but without relief. The breathing continued with such a loud croupy sound, that no person in the house could get any sleep, nor could the young lady herself for many nights in succession. All this time the pulse was regular, the skin cool, and the tongue clean. One physician pronounced the disease to be ulceration of the larynx, and requested to be sent for when the lady died, that he might demonstrate the truth of his opinion on the corpse. One or two accused the patient of simulating the symptoms. The complaint had continued for two years, at which time she had entirely lost her voice, not being able even to whisper. Tonics did more good than any other remedies, and the disease was once completely interrupted by the scruple doses of carbonate of iron, prescribed by Sir A. Cooper.

48. *Dysphagia.*—A beautiful and handsome young woman, about 16 years of age, had menstruated regularly for a year. The sudden death of an indulgent father at the catamenial period caused an immediate flooding, accompanied with fainting and trembling fits, which seemed to be hysteric, and in a short time went off. She continued pretty well until the next catamenial period, when the fits again recurred. At the next period the menses were suppressed, but the fits again came on, and were more frequent and violent, and evidently convulsive. In a short time she was bled and emetics administered. A few days after the operation of the latter she was seized with a difficulty in swallowing, which increased so much, that deglutition became impossible; and the attempt to perform it caused fits of trembling, and "reciprocal distension of the thorax and abdomen," ending in absolute rigidity of the whole body. The cause of the dysphagia seemed to be a spasm of the œsophagus, two inches below the larynx. She swallowed nothing for thirty-four days, when a probang was introduced, after which she was able to swallow with ease any food offered, for about three weeks; but vomited every thing except her medicines, cherries, and strawberries. The bowels were constipated, and enemata were occasionally administered. After one of these she had a very considerable evacuation of blood from the anus. After an interval of rest the dysphagia returned, and she swallowed nothing for fifty-four days. During this time she was affected with fits of tetanus more violently than ever, and was insensible during them. An attempt to introduce a probang, or the slightest mental irritation, used to cause a paroxysm. After she had fasted three or four weeks she first lost her sight,—her eyeballs being drawn up with a convulsive motion,—and soon after her hearing. She knew her friends, how-

ever, by the touch, for when any of them took her by the hand, she would call them by their right names.

When she became able to swallow, she drank ale or whey, and eat apples or pears, but no bread or other solid food for several months, during which she was confined to bed. At the end of this time, hard swellings appeared behind the ears, and she was then able to sit up and eat any kind of vegetable food, but could not taste flesh or broth. During these fastings she did not become emaciated. Her bowels were also obstinately constipated; in the second they were not moved for a month.

She died suddenly. The œsophagus only was examined, and was found free from marks of disease.

49. *Vomiting.*—Elizabeth Martin, aged 21 years, stout and well made, dark-gray eyes, auburn hair, face pitted by the small-pox, was admitted into the York County Hospital, under the care of Dr Belcombe, May 26th 1836, complaining of incessant vomiting. She left the hospital at the end of the preceding February, after having been treated nearly three months for a similar affection. During that time, as I learn from the physician's book, many remedies were employed, and without permanent relief. The following are the principal; emetics; blisters and leeches to the epigastrium; leeches to the region of the heart; potassa; bismuth; mercury; opium; hydrocyanic acid; quinine; strychnine; and camphor.

Her health had always been good until she was seventeen years old, when she experienced a severe attack of the small-pox. On recovery, she continued generally indisposed, and was particularly affected by rigors, not followed by heat or sweating, and accompanied by acute pain, described as if great pressure were applied to the head, pain in the epigastrium, dry brownish tongue, and quick pulse.

She remained in the hospital eighteen weeks. An epitome of the principal symptoms which showed themselves during that period will sufficiently characterize the disease. After a rigor, as described, she used to vomit all food whatever, whether solid or liquid, for many days in succession. Sometimes the vomiting occurred daily soon after dinner, and at any time upon slight mental excitement, as for instance, that caused by the approach of the medical officers, pupils, or strangers. Her appetite was moderately good, the menses regular, and the bowels constantly constipated, requiring the frequent use of active purgatives. The tonsils were enlarged. She complained of severe headach and toothache; of pain between the shoulders; and tenderness of the spine, but particularly over the dorsal vertebræ. The abdomen presented a globular enlargement, was very tense and tympanitic, and the patient constantly rubbed it gently with her hand to relieve the severe colicky pain she experienced in it. It would be quite useless to specify all the remedial measures adopted. The fœtid gums were of no service; acetate of morphia in large doses seemed to do some good; kreosote at the first exhibition relieved the vomiting for five or six days. An incautious exhibition of a small dose of ipecacuana re-excited the vomiting, and kreosote was ever after of no effect. By the general means adopted, the intensity of the symptoms were mitigated, and the patient returned to her home in the country. She subsequently became quite well. Dr Belcombe informs me that her sister suffered from a similar affection.

50. *Hiccup.*—A lady received some melancholy news while menstruating, and the menses were immediately suppressed. On this suppression there supervened most distressing hiccup, which lasted with great violence for thirty-six hours, and then intermitted for twenty-four hours. The hiccup thus continued to recur periodically for several weeks, and with serious effects on the lady's health. It was at last cured by a course of active purgatives.

51. *Hiccup and Aphonia.*—A female, aged 24, complained of pain in the back part of the head, irregularity in the catamenia, and occasional attacks of hiccup lasting for a few hours. Sometimes instead of hiccup she suffered from complete aphonia, so that for a time she was incapable of uttering a single sound. Leeches to the anus relieved the aphonia, but the hiccup continued very distressing. Under the repeated application of tartar emetic to the epigastrium the hiccup at last disappeared.

52. *Frequent Sipping.*—Dr Graves was called to a young lady who was represented to be in a state of imminent danger. On entering the lady's room he found her surrounded by several female friends all in the greatest alarm. Her countenance was pale, and had an anxious expression, and about every five seconds she sipped an extremely small portion of water, which she immediately swallowed, but with a considerable effort, although the quantity was so trifling. She said that she should be immediately choked if she discontinued the sipping, for the moment she attempted it, she felt an intolerable uneasiness at the root of her tongue and in her throat, threatening immediate suffocation. So urgent were these sensations, that, if an attempt was made to prevent her sipping, she immediately screamed in agony, was agitated with convulsions, and seemed about to expire. She could make a full inspiration without wheezing or noise in the chest; and there was no appearance of disease at the root of the tongue or in the fauces. She was a young lady of an extremely delicate and nervous habit, being very sedentary, and subject to frequent attacks of common hysteria. Dr Graves, aware of these circumstances, immediately removed a number of leeches which were attached to her throat, stopped the bleeding as soon as possible, and gave her draughts consisting of camphor, aromatic spirit of ammonia, and black drop, under the influence of which the nervous irritation soon subsided, and she fell asleep.

53. *Masked Hysteria.*—C. Hepworth, a young female aged 19 years, of fair complexion, light hair, and rather muscular, was admitted into the York County Hospital on July 6, 1837, under the care of Dr Belcombe, complaining of pain under the left breast, sleepless nights, and palpitation; more particularly she suffered from

a sensation in the left hypochondrium, as if a hot tin vessel was applied to the skin, or as if leeches were fastening upon it. She began to menstruate at the age of 16 years, but the menses were very irregular until about a year ago. At each menstrual period she suffered great pain, her urine was scanty, not amounting to seven ounces in twenty-four hours, and she had great difficulty and pain in evacuating the bladder. In the preceding April she first suffered from back-ache, but in other respects continued well every day until eight or nine o'clock in the evening, when her abdomen used to become exceedingly tense and tender, and she was wont to vomit excessively for an hour or two, when all the symptoms disappeared and she again felt tolerably well. Upon examining her back, the cervical and several dorsal vertebræ were tender to the touch. By occasional leechings, aloetic purgatives, and tonics, she recovered in a few weeks, and was discharged.

On the 3d of September following, she was again admitted, complaining of the same symptoms. The tenderness was now over the whole surface of the back, and the arms were equally as tender on pressure as any portion of the spine. She had, in addition, frequent numbness and pricking of the legs; headach, dimness of sight; sweatings across the loins, and most obstinate constipation of the bowels; the urine was white and opaque, passed with difficulty, and in small quantities. The appetite was very variable, sleep never sound, and seldom continued for half an hour at once. The same means again relieved her in a few weeks, from the more pressing symptoms.

54. *Imitative Hysteria.*—On an afternoon about a year and a half ago, I was hastily called into the Woman's Surgical Ward of this hospital, in consequence of a sudden attack of illness in several of the patients. A young, well formed female, with disease of the right hip-joint, had complained of headach and neuralgic pains during the morning; she was at last suddenly seized with violent retching, crowing breathing, sense of suffocation, aphonia, inability to swallow, suffusion of the face, violent headach, and tumefaction and pain of the abdomen. A young female patient who went to her assistance became soon affected in a similar manner, the retching in her being most distressing. A third in an adjoining bed was next affected with violent convulsions, terminating in paleness of the face and complete insensibility. Her pulse and respiration could scarcely be observed. At last a fourth began to retch and vomit, and then cough incessantly, except when interrupted by a loud convulsive sob. I must confess I had no conception at first of the nature of the affection, but suspected, from the great retching and vomiting, that the patients had taken something poisonous. Under this impression I dispatched a note to Dr Wake, at that time senior physician of the hospital, requesting his assistance, and proceeded to make the necessary inquiries. An old Irish nurse, attached to another ward, said she had frequently seen the same thing in the Lying-in Hospital at Dublin. I then remembered Boerhaave's well-

known cases in the Orphan House at Haarlem, and by administering suitable remedies, the patients were all relieved within three hours.

55. *Imitative Laughter.*—A volume might be written on the singular effects produced by the convulsive movements of one individual in another in perfect health, very commonly exciting a similar series of movements. One of the most curious instances may be found in the history of the dancing mania of the year 1374, given by Hecker in his *Epidemics of the Middle Ages,* (recently translated by Dr Babington.) This mania extended over the whole of Germany, and occurred soon after that dreadful pestilence commonly called the Black Death. An account of several such epidemics may be found in Vol. iii of this Journal, p. 434. The preaching of the celebrated John Wesley, as is well known, was frequently followed by convulsive movements in his hearers. Many instances of the effect of great nervous excitement are scattered through his journal, the phenomena of some having a singular resemblance to the clair-voyance of mesmerized patients, others being cataleptic, epileptic, &c. Wesley was quite at a loss to account for such extraordinary phenomena, the reality of which he could not doubt, except on the principle of supernatural agency. In more modern days, they have been attributed to an equally, or perhaps more incomprehensible cause. The following instances of *hysterical laughter* are quoted from Wesley's very curious and interesting journal.

" Friday 9th" (May 1740,) I was a little surprised at some who were buffeted of Satan in an unusual manner, by such a spirit of laughter as they could in no wise resist, though it was pain and grief unto them. I could scarcely have believed the account they gave me, had I not known the same thing ten or eleven years ago. Part of Sunday, my brother and I then used to spend in walking in the meadows and singing psalms. But one day, just as we were beginning to sing, he burst out into loud laughter. I asked him if he was distracted? and began to be very angry, and presently after to laugh as loud as he. Nor could we possibly refrain, though we were ready to tear ourselves in pieces, but we were forced to go home without singing another line."

"Wednesday 21, in the evening such a spirit of laughter was among us, that many were much offended. But the attention of all was soon fixed on L. S., whom we all knew to be no dissembler. Sometimes she laughed till almost strangled; then broke out into cursing and blaspheming; then stamped and struggled with incredible strength, so that four or five could scarce hold her. Most of our brethren and sisters were now fully convinced that those who were under this strange temptation could not help it. Only Elizabeth B. and Anne H. were of another mind; being still sure any one might help laughing if she would: This they declared to many on Thursday; but on Friday 23d, both of them were suddenly seized in the same manner as the rest, and laughed whether they would or not, almost without ceasing. Thus they continued for two days a spectacle to all, and were then, upon prayer made for them, delivered in a moment." A vast majority of this society consisted of females, and from the expression, *if she would*, appear to suffer most from the singular convulsion.

56. *Paralysis and Tetanus.*—A widow, aged 37 years, entered La Charitè complaining of violent palpitation, tightness of the chest, and pain in the left side, all which she attributed to a fall about 18 months previously at a time when she was in the habit of being bled every two months. The pulse was found to be irregular and intermittent, and the heart beat over a considerable space ; no œdema was observed. She was the mother of five children, and was always well until some afflictions and misfortunes disturbed her health and reason. Bleeding from the arm and by leeches and a rigid regimen abated the cardiac symptoms, but they were succeeded by violent hemicrania, chiefly of the right side, which was relieved by the application of cold water in the night. Whenever it was thus relieved, she felt distressing numbness and stiffness in her limbs. In the course of a short time, there was complete paralysis of the right side, with loss of sensation. In the beginning of September, the right lower extremity, hitherto paralytic, became rigidly extended and tetanic. When flexion was forcibly induced great pain followed. Both thumbs were then similarly affected, and little sensibility remained in either of the arms. Moxas to the loins restored sensibility to the legs, but a most intense pain was now felt in the region of the heart, radiating from thence along the left arm. There was no fever nor convulsions. Next day a sense of constriction was felt in the throat, deglutition became difficult, and the voice was extinct. During the next four days, various hysterical phenomena showed themselves, and were ended by the appearance of the catamenia, and complete disappearance of all the previous teasing symptoms.

57. *Tetanus.*—A strong country girl was pursued whilst menstruating by a dog which she thought mad. She was consequently very much alarmed, and the menses were suppressed. They did not reappear at the usual periods, and in September following, she suffered from creeping sensations in the legs, together with slight spasms and involuntary motions. These disappeared in a few days, but returned a month afterwards with greater severity. The legs now also became forcibly flexed on the thigh, so that the heels touched the nates, and every attempt to extend them produced the most acute suffering. In five days these symptoms disappeared, the affected parts feeling weak only.

In a month the same phenomena recurred and continued again for five days only, but left her much weaker in her legs, so that her gait was vacillating. Leeching and cupping the loins, vapour of water to the pudenda, with leeches, baths, and other measures had the effect of restraining the muscular spasms, but did not restore the catamenial discharge. Eleven months after their first suppression, the *menses* became copious, and the patient ever after enjoyed excellent health.

58. *Epilepsy and Dysphagy.*—An unmarried female when aged 30, in consequence of either trouble or fright, was seized with fits which returned once in twenty-four hours, generally in the night, and so continued for three months. They afterwards became more frequent, especially in the summer months, when she was deprived of her memory and almost all her mental faculties. Ten years from the commencement of the illness they returned twice or thrice a week. During the paroxysm she became violently convulsed, foamed at the mouth, and was insensible. After they had continued five years, she was affected with a difficulty of swallowing, and a sensation of tightness and stricture in the throat and breast, and was unable to swallow either solids or liquids for seventeen days. Neither had she any evacuation by urine or stool, but had a small discharge of blood from her ears. On the 17th day, a probang was introduced with ease into the stomach. On withdrawing it she fainted but recovered in a quarter of an hour, had a stool, and passed a few ounces of gelatinous urine. This difficulty of swallowing, and the accompanying symptoms continued to return regularly every month for two years, and were constantly removed as at first. When free from the dysphagia, she was constantly affected with the epilepsy. She was at last cured by the ammoniated copper.

59. *Chorea, Paralysis, Epilepsy.*—A female, who first menstruated at the age of 14 years, the menses recurring every fortnight, was frightened during their flow at the annual period, when aged 17. The catamenia were immediately suppressed, and hysterical fits and tremblings of the limbs succeeded. The latter symptoms became aggravated, and in two months she was utterly unable to remain at rest one moment, in consequence of the violent agitation of the limbs. There was one series of motions frequently repeated, which consisted in a rolling of her clenched hands quickly round each other, with a thrusting forward of the right in a very systematic manner at every third revolution.

She had occasional pains in the head, back, and loins, and under the left mamma, sleeplessness, excessive irritability, palpitation of the heart, and constipated bowels. After a few months epileptic fits came on; she had a foolish imbecile stare, and appeared almost regardless of surrounding objects; her lower extremities seemed paralytic; she had pain along the spine, and the bowels were confined. During the epileptic paroxysm she had violent opisthotonos and tumultuous action of the heart; the fit ending in a profound sleep, which was wont to continue many hours. The slightest touch when the violence of the paroxysm was subsiding, used instantly to reproduce it. In this state she continued many months.

The chorea was removed by electric shocks through the pelvis, and the fits recurred also with diminished violence and frequency.

60. *Mechanical repetition. Coma.*—Two young ladies of very nervous temperament, active minds, excitable temper, and twins, had, for some years, and exactly the same length of time, been the subject of fits of hysteria, accompanied with a choking sensation

and convulsions. In these fits they were continually affected with a motion of the head and arms, regularly occurring in accurate time, and accompanied by the words "tic tic" like a clock. They were sometimes insensible, sometimes sensible, and would say "I cannot help it; but there is the tic coming," and then would make a sound like that of a clock, "tic-tic." Occasionally they would utter distinct words "I cum, I cum," or "hi cum, hi cum." At last they both fell into a state of imperfect sensibility, their respiration scarcely perceptible. One of them died. The other had extreme sensibility of the surface of the trunk, "a symptom very common in hysteria, so that the slightest touch with the end of the finger gave her exquisite pain, caused her to groan and nearly shriek, and say 'hi cum,' two or three times, and then the head to begin moving from side to side, and then the hands and fore-arms to semi-rotate in and out, in regular time, the motions being accompanied by the words tic-tic, tic-tic; the second tic being pronounced some notes lower than the first. This morbid sensibility of the surface is purely a state of the sentient nerves." The trance-like or insensible state continued for some weeks, during which time the difficulty of swallowing was so great, that a tea-spoonful of fluid could only be got into the stomach by pressing on the situation of the arytenoid cartilage after it was put into her mouth. At one time there were great heat and throbbing of the temples. Sometimes she was so far conscious for a short time as to be able to write, or open her mouth for food, and eat it ravenously, but soon went off again. In the corpse of the deceased sister, nothing but a remarkable deficiency of blood could be observed. The brain was excessively exsanguineous.

61. A married female, aged 22 years, the mother of two children, one of which was at the breast, menstruating regularly, but in an employment which exposed her to sudden alternations of heat with cold and moisture, was attacked by neuralgic pains of the face, temples, and teeth. Soon after there was a feeling of a heavy sensation in the eyes, and the mother on examining them observed that they had a peculiar wildness. An involuntary motion of the eyelids then commenced, in which they were opened and shut with excessive rapidity for about fifteen minutes. In about ten minutes the motion commenced in the extremities; the palms of the hands were beat rapidly upon the thighs, and the feet upon the ground; the fore-arms were rubbed incessantly along the thighs; the radius rotating upon the ulna at the same time that the hand was turned prone and supine during its progress. The arms were at times extended, and the palms of the hands suddenly turned outwards; the back of the wrists were repeatedly and violently struck against each other, while at other times the middle-fingers, being extended inwards, struck the palm of the opposite hand, and so alternately with an almost inconceivable quickness. During these different actions of the superior extremities, the feet incessantly beat the ground, and occasionally the eyelids were opened and shut violently. This affection commonly ended in headach of short duration, with

sickness and vomiting. Subsequently she had often a sudden propensity to leap upwards, or to go into every corner of the room and strike the furniture and doors violently with her hand as she passed, the sound giving her great satisfaction. The next day, kneeling on one knee with the hand upon the back, she often sprung up suddenly and struck the top of the room with the palm of her hand. To do this she rose fifteen inches from the floor. In the evening the family observed the blows upon the furniture to be more continuous, and to assume the regular time and measure of a musical air. As a strain or series of strokes was concluded, she ended with a more violent stroke or a more violent spring or jump. The next day the motions became more regular, and it was curious to see the patient moving around the room with all the vivacity of a country dance, or the graver step of the minuet; the arms frequently carried, not merely with ease but with elegance. When she looked upwards, there was an irresistible impulse to spring up to touch little spots or holes in the ceiling. When she looked round she had a similar propensity to dart the forefinger into little holes in the furniture, &c. One hole in the wooden screen received the point of the forefinger many hundred times, which was suddenly and involuntarily darted into it with an amazing rapidity and precision. At last it was discovered that she danced with avidity to music. A drum and fife were procured, and she danced to the favourite popular air of the "Protestant Boys." In whatever part of the room she happened to be, she immediately turned and danced up to the drum, and as close as possible to it, and there she danced until she missed the step, when the involuntary motions ceased. A rapid performance, or a continued roll on the drum would check the motions altogether. She said there was always a tune dwelling upon her mind, which at times becoming more pressing, irresistibly compelled her to commence the measured movements. She had a sensation as if insects were creeping in circles over the skin, especially upon the thighs. The alvine discharge was occasionally offensive, unnatural in colour, and slimy. Pulse from 108 to 130. During the intermissions she attended as usual to her household affairs, and her intellect was quite sound. After the disease had continued seven or eight days, an eruption appeared on the skin, particularly about the elbow, in diffused patches of a bright red colour, and went off on the third day. During the continuance of the eruption. the menses appeared, and she was soon restored to her usual health.

It was curious, that previously to her complaint she could never dance, not even a country dance, and yet during the paroxysm she executed very difficult steps.

62. A young female, aged 15 years, of good health and habit of body, and sanguineo-choleric temperament, was picking some straws from the ground, when a large black spider ran on the back part of her hand, and, without her attempting to molest it, having heard, as she said, that it was good luck, soon ran off. The same afternoon she had involuntary twitches in the arm and side; in the

evening they were painful. Her stomach then became the seat of pain; she vomited, and on the third day had paroxysms something like hysteric fits, combined with the St Vitus' dance. She had also a remarkable increase of sensibility. When in her fits she used to make movements with her hands and fingers as if after a tune; and when music was introduced, her motions corresponded, beating with her hands and finger-ends upon her breast as if dancing, and sometimes when, from the violence of the spasms she could not regulate her motions, and would strike too hard, it was common for some of her attendants to place their hand to receive the blows. She appeared best pleased when her father's hand was placed for this purpose; and if another person ever so gently endeavoured to substitute his own, she would immediately push away the strange hand, and seek for her father's. This she did, although to every thing else insensible, and with her eyes closed, and as it appeared by the simple touch of her finger-ends. Her muscles were continually affected with spasms during the paroxysms. When the music began, it in a great degree relaxed the spasmodic tension, and the convulsive motions were changed for the measured movements of her hands, following the tune. The tension remained, however, in her fingers, which were widely separated from each other, and stiff as sticks. When the fit began to abate on one occasion, although her eyes had not been opened after, Dr Cornstick, the narrator, entered the room, by merely feeling his clothes, she could tell the colour of each article. This faculty she possessed in such an eminent degree, as to be able to point out different colours upon one piece of cotton, linen, or woollen cloth, and discover each different material when wove into one piece. After feeling Dr C.'s hand for some minutes with great attention, she would afterwards tell what things he had held in it. This cost her more time and study than distinguishing colours, and she was obliged to put the substances to her cheek as she had done Dr C.'s hand previously. Dr C. says these various circumstances were so confirmed by the most undeniable testimony, that he felt bound to believe the evidence of his own senses. Subsequently she had a surprising acuteness of the olfactory nerves, and great partiality to certain odours, and also to colours. Green and red caused the greatest pleasure, which she evinced by convulsive unnatural laughter. The sight of any thing transparent, and water poured slowly from one vessel to another, had the same effect. She would turn away her head from white or black and their compounds with aversion and with seeming horror. She had now an aversion to her relations, and the touch of one of them used to throw her into violent convulsions; her eyes were generally turned up under the upper lid; she had paroxysms of insensibility, from which she could be roused by music, and if put on her feet would dance for a long period without intermission, and with all her might, leaping a considerable distance from the floor, and continuing until she fell exhausted. Her eyes were closed while dancing. By allowing her to dance to music until she was exhausted, the paroxysms became less frequent, recurring every four or five weeks. During the intermission she had no unusual sensibility of sight or feeling, and did not remember what occurred in the paroxysm.

Nine months after the transit of the spider, the spot where it occurred became red, and a gangrenous eschar formed. After it sloughed off, her fits recurred less violently, but her hearing was so acute that she could hear persons whisper in the next room. The sore on her hand began to discharge green thick purulent matter in large quantities, and the fits ceased for five months. Once during that period the discharge suddenly stopped, and she was threatened with a return of the fits.

The fits were unaccompanied by pyrexia, nor was she at all emaciated during her illness. Once Dr C. saw her very sick during a partial paroxysm, retching continually; what she evacuated was a mucous matter in considerable quantities, which seemed to come from the fauces.

63. *Catalepsy and Somnambulism.*—Public attention is now so much directed to the phenomena of Mesmerism, that cases of somnambulism, ecstatic delirium, coma, &c. abound. I shall, therefore, give only one short case of somnambulism.

A female, aged 20 years, suffered for some months from catalepsy. The disease then assumed a new form. After a fit of catalepsy she used to yawn, raise herself up, and speak with more brilliant wit than she was accustomed to show, when unaffected with the paroxysm. She seemed to be addressing many persons who surrounded her, accompanying her conversation with gestures and motions of the eyes. She then began to sing and laugh, used to leap from bed, walk through the ward of the hospital, avoiding all obstacles, and, returning to her own bed, cover herself with her bedclothes, fall into a fit of catalepsy, and in about fourteen hours awake, quite unconscious of what had happened during the paroxysm. While in the sleep-walking state, Sauvages found her altogether destitute of sensibility. Loud, sudden noises, or the flame of a candle applied so near the eyes as to burn their lashes, could not rouse her or cause her to wink, or prevent her going on with her discourse. Spirit of wine was dropped into the eyes and mouth; tobacco and sal-amoniac put into the nostrils, and needles thrust into the body, without causing the slightest appearance of sensation.

64. *Insane timidity,—Cataleptic tendency.*—Elizabeth F., aged 21, a delicate-looking girl, was much frightened by her father running after her with a knife in his hand threatening to kill her. She was admitted into the York County Hospital on March 9th 1837, supposed insane. She was very timid, and asked if those around her were going to kill her. The mammæ were small, the abdomen flaccid, and tender to the touch. The catamenia were suppressed for three months. The countenance was fatuous, and she complained of pain in the knees. During the day she was moderately quiet and rather sensible, but at night she was very restless, could scarcely be kept in bed, and called very loudly for her mother. Saliva dribbled from her mouth in large quantities, with some relief to the evening exacerbation. In

two or three days she began to suffer from a distressing sensation of choking, and breathed like a person going naked into cold water, with short panting attempts at respiration. The day following, she vomited a good deal; her neck swelled, her face became lived; she complained of being suffocated, and immediately a fluid gushed out of *her mouth*, and another ran in a stream off her cheeks from *her eyes*. Her neck was wet with perspiration. while the rest of the body was dry. The appetite was ravenous; the pulse regular, but weak. Eleven days after admission she seemed to have no muscular energy: she used to put out her tongue when requested after considerable delay, but would then allow it to remain for some minutes in exactly the same position in which she placed it. If her arm was lifted in feeling the pulse, after I ceased to hold it, it used to continue in exactly the same position for several minutes. The dribbling of the saliva, which at one time flooded the bed and floor, now ceased, and her cries and screams at night became so dreadful, that it was necessary to remove her from the hospital, and the parish officers directed her to be sent to the York Lunatic Asylum. A few weeks after her removal I visited her, and found her laid with her head on a table, the saliva dribbling from her mouth. She answered all questions by a vacant, anxious stare. Subsequently she began to employ herself, and in January of the present year went home convalescent. No medicine was used.

65. *Insanity, Catalepsy.*—A remarkably fine young woman, well educated, aged 22 years, of fair complexion and good constitution, received an abrupt proposal of immediate marriage, to which she hesitatingly consented; but the conflicting emotions of her mind prematurely brought on the catamenia. Reluctance to disclose a circumstance of so much delicacy as an excuse for delay, and the fear of losing an advantageous match, violently agitated her feelings, and in this state of body and mind she was married, and set off to travel on the same evening with her husband in a stage coach, to the place where they were to sleep. During the journey her passions were highly excited, and subsequent intercourse was attended with much pain. After having slept for about an hour, she suddenly awoke in a violent alarm from a frightful dream, and complained of a dreadful pain in her head. Presently she jumped out of bed, attempted to open the window, and for a short time fainted. On recovery she became delirious and furious. The catamenia ceased from this time. A medical practitioner immediately bled her, and treated her with active purgatives and strict antiphlogistic measures. In about three weeks she was much recovered, but relapsed from over-excitement, and fell into a state of melancholy, when she came under the care of Dr Burrows. Her countenance was sullen and pale, the eyes heavy, turgid, and cast downwards; the tongue foul; the bowels inert; the pulse rather full and slow, and the surface, especially of the extremities, below natural heat. She answered few questions, and those only in monosyllables, and was very reluctant to move. After purgatives had removed a quantity of scyba-

lous excrement from the bowels, and mercury affected the mouth, she improved considerably, but so soon as the salivation ceased, all the former symptoms became more intense, and certain cataleptic appearances were observed. She preserved the exact posture, whether lying, sitting, or standing, in which she was placed; eat mechanically, and answered no questions. The skin was like white wax, and very cold; the pulse was feeble; the respiration undisturbed, and scarcely perceptible. The pulsations of the carotids were very quick, and so strong as to be plainly counted by sight. At last all these symptoms were suddenly aggravated; she became a perfect statue; sensation and volition were quite suspended; the evacuations were discharged involuntarily; mouth open, and saliva flowing from it in large quantities; a constant sardonic grin; the eyes immovable, and imbedded in the upper eyelids; every limb retained the position in which it was placed, even the most painful, and that for a time impossible to be preserved by any one in health. The pulse was soft and slow. Leeches to the head, and blisters to it and to the spine, warm baths, and other means were used with considerable success. At last she rose one morning in possession of every faculty, mental and bodily. She voluntarily assisted in domestic affairs, and talked rationally and cheerfully. She had a perfect recollection of being brought into the house, and of most things prior to the attack of catalepsy; but from the accession of that affection all was a blank.

On the next day, unfortunately, she relapsed into her previous state. A seton to the occiput for six months, and then a removal to the sea-side; the use of the warm and cold sea-bath; and a great deal of exercise, caused the menses to reappear with a flow as great as occurs in many miscarriages. From this date her recovery was complete. She subsequently bore several children. and ten years after she had no return of her disease.

66. *Infanticide.*—Scarcely a week passes without a case being reported in the public papers of infants being killed by their mothers, especially by *young* mothers. Having already occupied too much space with cases, I must merely refer to various writers (especially the phrenological) on the subject.

67. *Insane Cunning.*—An unmarried woman, about 25 years of age, was admitted into the Aberdeen Infirmary, for a stoppage of the menses, which had occurred about two years and a half before. This was attended with pain in the region of the kidneys, and course of the ureters, and with difficulty in voiding her urine. Some months after this, the pains becoming more violent, and being chiefly seated in the region of the uterus, she discharged from the vagina a large round stone of a reddish colour, with a rough scabrous surface, which she said she was certain came from the uterus. From that time to the day of her admission into the Infirmary, no fewer than twenty-five stones of the same kind were voided or extracted from the vagina by different people. At the time of her admission into the Infirmary, she required the frequent use of the catheter. She was sounded, but nothing could be discovered in the bladder. The

vagina and *os tincæ* were natural. She remained about two months in the hospital, during which time, on several occasions, she complained of the pain and other symptoms which preceded the discharge of the stones. Upon examination, stones were found sticking in the vagina, which in colour and appearance resembled calcined bricks. The *os tincæ* was not dilated, and there was no appearance of laceration. Deception was suspected, and such measures taken as led to her confessing the whole to be an imposition. Dr Livingston remarks, that she had an unblemished character in the country where she resided, and that she never sought for charity of the public. A medical practitioner had entertained her in his own family for some time, with great humanity, and extracted two very large stones from the vagina. When Dr L. hinted his suspicions of an imposition to this gentleman, he was much affronted; and some other people loudly exclaimed that Dr L. had neither charity nor humanity, in suspecting the poor distressed woman of such an intention.

A case very similar to this is recorded in the seventh volume of this Journal, page 437.

It would be quite useless to attempt an apology for my apparent presumption in undertaking an analysis of phenomena so varied and extraordinary. I know of none adequate to excuse it. The lengthened details of some of the histories may appear tediously minute,—a circumstance I shall venture to notice.

When a case is reported to illustrate some special point of practice, a vivid outline is alone necessary. If, on the contrary, the object be to elucidate the philosophy of disease, minute detail is imperatively demanded, just as in any philosophical experiment; and it is the absence of this which renders a vast number of anomalous cases useless. The facts are so few and so imperfectly related, that no useful comparison can be instituted. I am, consequently, rather inclined to lament the brevity, than the length of these histories; and would shield myself under the opinion of Baglivi:—"cæterum nil magis ad veritatem axiomatum conducit, quam exacta ac prorsus austera symptomatum omnium utut minimorum, utut vilium, ac penè inutilium in morbo observatorum descriptio.—*Natura* NIL *molitur frustra*, minimaque sunt sæpius magnarum rerum initia, et minima quoque ad notitiam grandium nos conducunt."* The following is a list of references to such of the preceding cases as are quoted.

29. Edin. Med. Essays and Observations, Vol. ii.

30. Van Swieten, Comm. apud Boerhaave, ed. 2da. Lugdun. Batavor. Tom. iv. p. 418.

31. Journal de Medecine, 1815, quoted in the New London Med. and Phys. Journal, Vol. ix. p. 496

---

* Baglivi, de Praxi Medica, Lib. ii. Cap. iii. Sect. vii.

32. Trans. Medicales, 1830, and Med. Chirurg. Rev., New Series, Vol. xv. p. 496.

33. Reported by Mr Blundell in London Medical Gazette, Vol. xvi. p. 347.

35. Edinb. Med. and Surgical Journal, Vol. xliv. p. 376.

37. Illustrations of the Diseases of the Breast, by Sir A. Cooper, Bart., Part I. p. 81, 4to, Lond. 1829.

38. London Medical Gazette, Vol. vi. p. 59.

39. 40. Sir A. Cooper, in op. cit. p. 87.

41. Journal Complement. 1828, and London Med. and Physical Journal, Vol. ix. p. 362.

42. London Medical Gazette, Vol. vii. p. 30.

43. Rust's Magazin für Gesammte Heilkunde, 1825, and Med. Chirurg. Review, Vol. v. p. 525.

45. Memoir on Visceral Neuralgia, by Mr Solly, noticed in Med. Chir. Review, New Series, Vol. ix. p. 337.

46. M. Cusan, Archives Gen. de Med. 1827.

47. Med. Chir. Rev. New Series, Vol. iii. p. 385.

48. Edin. Med. Essays and Observations, Vol. v.

50. 51. Memoir on Visceral Neuralgia, by Mr Solly, in op. cit.

52. The Dublin Journal of Med. and Chem. Science, Vol. iii. p. 165.

55. Wesley's Works, 8vo, Lond. 1809, Vol. ii. p. 35, 36.

56. Journal Hebdomadaire, 1827, and Med. Chir. Review, New Series, Vol. x. p. 462.

57. Journal Complement. 1828, and Lond. Med. Gazette, Vol. i. p. 805.

58. Dr Heysham, in Duncan's Med. Commentaries, Vol. vii. p. 428.

59. Dr Addison, in Guy's Hospital Reports, Vol. ii. p. 496.

60. Dr Elliotson, in a Clinical Lecture, Lond. Med. Gazette, Vol. vii. p. 728.

61. Mr Wood, in Med. Chir. Trans. Vol. vii. p. 238.

62. Dr Cornstick, of South Kingston, Rhode Island, in Med. and Phys. Journal, Vol. xx. p. 224.

63. Sauvages in Mem. de l'Acad. des Sciences, l'an 1742, p. 557; also in Nosol. Method., Tom. i.

65. Commentaries on the Causes, &c. of Insanity, by G. M. Burrows, M. D. p. 185. 8vo. Lond. 1828.

67. Edin. Med. and Philos. Commentaries, Vol. iv. p. 452.

(The continuation in Next Number.)

ART. VII.—*Notice regarding the Composition of James' Powder.*[*] By DOUGLAS MACLAGAN, M.D. Fellow of the Royal College of Surgeons of Edinburgh.

THE well known "Fever Powder" of Dr James is a patent nostrum which has been in constant use for a century, both in general and domestic practice, as a febrifuge. Its mode of preparation has always been made a secret; and though it was avowed to contain antimony, its composition was not known, until Dr George Pearson gave an account of an analysis of it, from which he inferred its composition to be oxide of antimony and phosphate of lime. The London College of Physicians, considering it to be a valuable preparation of the active substance antimony, introduced into their Pharmacopœia an imitation of the patent medicine, under the name of *Pulvis Antimonialis*, which has subsequently been adopted by the other British Pharmacopœias. This *Pulvis Antimonialis* has always been prepared by roasting together hartshorn shavings and the black sulphuret of antimony, by which process, the former by the destruction of its animal matter, is left in the form of phosphate of lime, and the latter acquiring oxygen is converted into the second compound of antimony and oxygen, now called antimonious acid. Both James' powder and the *Pulvis Antimonialis* are, rather heavy, white, insipid substances. Their medicinal properties are to promote perspiration, and, if taken in large doses, to excite vomiting or purging.

But though it was known from the specification lodged in Chancery by Dr James, that his nostrum contained antimony, it was equally well known that it could not be prepared according to the formula there given, and therefore the exact state of combination in which the antimony existed was not ascertained. Dr George Pearson, in the 81st volume of the Philosophical Transaction, first published a series of experiments which he had undertaken with a view to determine this point. Mr Chenevix, in the Philosophical Transactions for 1801, also made known some observations on this substance. Berzelius, in his *Lehrbuch*, casually notices some experiments made by himself on a portion of James' powder; and lastly, Mr Richard Phillips, in the 20th volume of the Annals of Philosophy, gives an account of the composition of the *Pulvis Antimonialis* of the Pharmacopœia.

Dr Pearson's anaylsis is laborious and complicated, and, from a great part of his experiments, little information can be derived. He found that water dissolved a small portion of James' powder, and that what was dissolved consisted of lime in combination with phosphoric acid, and a small portion of metallic oxide. The remainder of the powder he subjected to the action of acids and other reagents, and was led to conclude that it consisted of 43 per cent. of phosphate of lime, and 57 of a calx, *i. e.* oxide of antimony, which he believed were united together as a triple compound. He detected a trace of iron in James' powder, occurring as an accidental impurity ; and Mr Phillips notices the same circumstance in his experiments on *Pulvis Antimonialis.* This, most likely, is in both cases derived from the apparatus employed in the manufacture, and probably accounts for the fact, that even with colourless muriatic acid the James' powder gives a solution of a slightly yellowish tint.

---

[*] Read before the Royal Society of Edinburgh, 15th January 1838.

The paper of Mr Chenevix (Phil. Trans. 1801,) is written chiefly with the intention of suggesting the propriety of preparing the powder by precipitation, by which means the uncertainty always attending the action of furnace heat might be avoided. He proposes to dissolve together in muriatic acid the protoxide of antimony and phosphate of lime, and to precipitate them by ammonia. This might certainly give us a useful preparation of the protoxide of antimony, but it would be widely different from James' powder, which consists of the peroxide, a substance of a totally dissimilar nature. At the same time it is obvious that the phosphate of lime can have no other effect than that of increasing the bulk of the powder. In the course of his paper Mr Chenevix mentions his having made an analysis of some specimens of James' powder, which he believes generally to contain about 44 per cent. of peroxide of antimony, of which Dr Pearson found about 57. Mr Chenevix likewise gives his reasons for believing the ingredients of James' powder to be mechanically mixed, not chemically combined. The experiments of Berzelius on James' powder are mentioned casually in his system of chemistry. He states that he found about 1 per cent. to be soluble in water, and he regards it as an antimonite of lime. The residue, he says, contains about two-thirds antimonious acid, and one-third phosphate of lime ; this makes the proportion of peroxide of antimony about 66 per cent. which is higher a good deal than Dr Pearson's. The Swedish chemist likewise regards the powder as being a mixture of its ingredients, not a chemical compound.

The most recent observations bearing on this subject are some remarks by Mr Richard Phillips in the 20th volume of the Annals of Philosophy on the *Pulvis Antimonialis* of the Pharmacopœia. This he regards as consisting of from 35 to 38 per cent. of peroxide of antimony, and from 62 to 65 of phosphate of lime. Mr Phillips does not seem to have tried whether any part of the powder was soluble in water ; and he did not believe that there was any protoxide (sesquioxide) of antimony in the portion dissolved in muriatic acid. He did not, however, employ as a test the sulphuretted hydrogen gas, which is the most certain method of detecting antimony in solution, and his other experiments on this point are not satisfactory. Mr Phillips also regards the *Pulvis Antimonialis* as a mere mixture of its ingredients.

It thus appears from these experiments that the general opinion with regard to both these preparations, is, that they consist of an insoluble oxide of antimony, and of phosphate of lime, not chemically combined, but mechanically mixed in variable proportions.

In general, they are believed, in point of medicinal virtue, to be nearly equivalent to one another, but most practitioners seem to find that the patent medicine is the less variable in its action of the two. From what I have been able to observe of the efficacy of these two powders, I am induced to subscribe to the above opinion; at the same time, I have often been disappointed in finding any beneficial effect from the true James' Powder, as well as from the *Pulvis Antimonialis*. I can by no means subscribe to the assertion of some physicians, that either of these preparations is invariably inert, but, on the contrary, have several times seen both purging, vomiting, and sweating produced by them. A substance, however, which is uncertain in its action, is even worse than one which is known to be inert, and, therefore, this last statement cannot be held as being much in favour of either of these medicines. Their inefficacy has been ascribed to their chemical composition, which the above analysis would lead us to believe to be of antimonious acid and phosphate of lime,—the former a very insoluble substance, the latter perfectly inert. None of these experiments, however, seem to offer any satisfactory explanation of the fact that these medicines are uncertain in their action, rather than inert. I have, therefore, been induced to make an examination of some specimens of James' Powder, with a view to ascertain this if possible.

There are two sorts of James' Powder found in the shops, one sold by Messrs Butler and Company, bearing the signature of a Mr James, a descendant of the inventor, who manufactures it; the other made by Messrs Newberry of London, each of which professes to be prepared according to the original formula of Dr James. Both preparations are alike in external appearance, except that in the specimens which I have met with, that prepared by Messrs Newberry seemed to be more finely powdered than the other.

One hundred grains of Butler's James' Powder were boiled for sometime in distilled water, and were found to have lost $2\frac{1}{4}$ grains. The solution yielded to sulphuretted hydrogen, a precipitate of sulphuret of antimony equal in weight to less than one-half of the loss of the James' Powder. It likewise yielded an abundant precipitate with oxalate of ammonia, and when tested with lead and nitrate of silver showed slight traces of phosphoric acid. This portion dissolved in water is said by Berzelius, who examined one specimen of James' Powder, to be antimonite of lime. It would appear likewise to contain some soluble superphosphate. When the solution is allowed to cool, it becomes hazy at a temperature of about 120°, and about 70° begins to deposit a white powder, which if it rest long adheres firmly to the glass. It can, however, be redissolved by heating the solution, or by adding a small quantity of muriatic acid. The deposition, however, does not take place if the solution is very much diluted.

Twenty grains of the James' Powder which had been treated as above were boiled for some time in pure strong muriatic acid, and seven grains remained undissolved. The solution was cautiously diluted with water, but contrary to my expectations no sesquioxide of antimony was thrown down. A large quantity of water was then added, and the fluid still remained perfectly clear. It was then exposed to a brisk current of sulphuretted hydrogen gas, and yielded a copious precipitate of sulphuret of antimony, which after being collected with the usual precautions, washed and dried, was found to weigh two grains.

The filtered solution was then boiled to expel all traces of sulphuretted hydrogen, carefully saturated with ammonia, and oxalate of ammonia added, which threw down an abundant white precipitate. This was allowed to remain in a warm place for twenty-four hours to settle, the oxalate was collected, washed, and dried, and was found to weigh thirteen grains. From these results it appeared that the composition of 100 grains of the James' powder was,

Antimonite of lime with some superphosphate,	2.25
Sesqui-oxide of antimony, - - -	9.8
Antimonious acid, - - -	34.21
Phosphate of lime, - - -	53.21
	99.47
Loss, - -	.53
	100.00

The experiments were all carefully repeated, and the results always approximated within a few tenths of a grain in the 100 parts.

I likewise endeavoured to determine the amount of phosphate by precipitating the phosphoric acid by lead. The result was so near as to confirm the statement given above, but the process is more tedious; and as the phosphates of lead are known not to be always identical in composition, I preferred estimating the phosphate of lime by ascertaining the quantity of the base.

Finding thus that the James' powder contained a proportion of sesqui-oxide of antimony, I repeated my experiments with other specimens of the powder, and found, that though all of them seemed to consist of the same ingredients, yet none of them contained these in similar proportions. Thus, without entering into details, I found another sample of this same James' powder to contain 2.8 per cent. soluble in water, 4.86 of sesqui-oxide, (only about half of what was found in the other specimen,) 40.82 antimonious acid,—the phosphate of lime which constituted the remainder being almost the same in quantity as in the other.

I then examined a specimen of James' powder prepared by Messrs Newberry, and its composition appeared to be 3.4 soluble in water, 2.89 sesqui-oxide of antimony, 43.47 antimonious acid, and 50.24 phosphate of lime. Of the part soluble in water a very small proportion only seemed to be antimonite of lime, the quantity of sulphuret which it yielded being only 0.3 grain, and the phosphoric acid being indicated in much larger quantity.

On making a set of comparative experiments with *Pulvis Antimonialis*, I found it to correspond in composition with the true James' powder, but, like the patent medicine, to vary very much in the proportion of its ingredients. Thus in one specimen I found only 0.8 gr. soluble in water, the sesqui-oxide amounted only to 3.98, the antimonious acid was 50.09, or rather more than one-half of the whole, and the phosphate of lime indicated by oxalate of ammonia corresponded within a few tenths of a grain to the remainder of the 100 parts. It would therefore seem from these experiments, that both James' powder and its imitation, contain a proportion of antimony in a soluble and therefore active state; that this proportion varies very much, being in the James' powder, sometimes equal to more than 9 per cent., at other times less than 3.

Mr Phillip's experiments by which he satisfied himself that there was no sesqui-oxide present, at least in the *Pulvis Antimonialis*, appear *a priori* to be inconclusive, and the above experiments prove, I think, that he was mistaken. He inferred that the muriatic solution contained none of this oxide, because, like the common muriate of antimony, it did not let fall any precipitate on diluting it with water. Had he employed the sulphuretted hydrogen he would have been set right on this point. I find that this oxide, as contained in James' powder, does not require for its solution that the muriatic acid should be either concentrated or boiling, but that it will take it up at common temperatures, and when diluted with three times its bulk of water.

It is certainly a curious circumstance, that in a preparation which has been exposed to a red heat, we should find any sesqui-oxide of antimony, which is well known at such temperatures to be converted into antimonious acid. May it not be that a certain proportion of it is combined with part of the phosphate of lime in the form of a triple salt, in which state it escapes the action of the fire? There seems to be no reason to suppose that the antimonious acid in James' powder is chemically combined with the phosphate of lime, as was believed by Dr Pearson, but merely that it is mechanically mixed with it.

If this account of the composition of James' powder should be found correct, it will, I think, afford a sufficient explanation of the uncertainty of this medicine, and of the very different estimation in which it is held by practitioners. Whatever virtues it possesses are probably due to the sesqui-oxide which it contains, and this we have seen to be the most variable of its ingredients. From the similarity of their composition, it seems probable that both James' powder and the *Pulvis Antimonialis* are prepared in the same way. The patent medicine seems, however, to have been found to succeed oftener than the preparation of the pharmacopœia, which may be owing to its being in general richer in sesqui-oxide from being more carefully exposed to the fire. I regret that I have not had time to compare a greater number of specimens of each, in order to see whether or not this is the case.

There does not, however, seem to be any thing in the composition or superior efficacy of James' powder, to justify the enormous price at which it is sold. Bottles which contain one ounce are charged at the extravagant rate of L. 1, 4s. whilst as much *Pulvis Antimonialis*, perhaps little inferior in value, may be had at any laboratory for 6d. or 8d.

129, *George Street*,
February 1838.

Art. VIII.—*Contribution to Statistics of the Mortality among Horses in Cavalry Corps serving in the United Kingdom, together with the number of Horses cast, and some preliminary Observations respecting the Selection, Training, and Feeding of Horses belonging to Dragoon Regiments.* By Henry Marshall, Esq. Assistant Surgeon 7th Dragoon Guards.

The Cavalry, or that class of troops which serve on horseback in the British Army, consists of two regiments of Life Guards, the Royal Regiment of Horse Guards, seven Regiments of Dragoon Guards, and * sixteen Regiments of Light Dragoons, of which the 7th, 8th, 10th, and 15th are Hussars, and the 9th, 12th, 16th, and 17th are Lancers.

The term *Life Guards* appears to have been originally *Leib* Guards, *body* guards, from the German *leib*, body, and it was perhaps introduced by the Hanoverian dynasty.

Dragoon.—This word is supposed to come from the Latin *draco*, draconarius being the appellation given to a standard-bearer who carried a standard or colour, with the figure of a dragon on it. The dragon is said to have been the standard of the Scythian cavalry.

Hussars.—This species of light cavalry originally constituted the militias of Poland and Hungary. In France they were formed into corps in the time of Louis XIII. under the name of Hungarian Cavalry; subsequently they were introduced into this country. The term hussar may be derived from the Persian word *Uswar*, cavalry, or the Sanscrit *Uswu*, a horse.

Lancers were introduced into the British service during the last war with France, in order to correspond to the class of cavalry called Polish Lancers in the French army.

Strength of Cavalry Corps.—All the regiments of Dragoon Guards and Dragoons on home service have six troops, except the first regiment of Dragoon Guards, which has eight troops. Each troop consists of 51 non-commissioned and troopers, and 42 horses, so that there are commonly 7 or 8 men per troop dismounted. Dismounted men are usually staff non-commissioned officers, farriers, and officers' servants.

Purchasing of Troop Horses.—The commanding officer of a cavalry corps is responsible for remounting the regiment under his command. Government allows the actual price paid to a dealer, not exceeding L. 26, 5s. for each horse delivered at the head quarters of a regiment, after having been carefully examined and approved of by the veterinary surgeon of the corps. The purchase-money of horses is paid by the regimental paymaster, under the direction of the commanding officer, by a bill on the agent of the regiment, at three days' sight, in favour of the dealer.

Eligible qualities of Troop Horses.—The question of fitness or unfitness of a horse for the cavalry must in a great measure be determined by the skill, the experience, and the discretion of the officer who examines him. No horse should be approved who is not free from functional and organic disease, and who has not the perfect use of his limbs, as well as the organs of hearing and sight. He ought, according to the language of horse-dealers, to be *sound* in every respect. Particular attention is always paid to the age, height, and strength of horses before they are finally approved. The minimum age at which horses are deemed eligible is about three years, and the maximum four years. As the age of horses is usually estimated by the appearance of the teeth, means are sometimes adopted by horse-dealers to make young horses appear to be somewhat older than they really are. For this purpose the milk teeth are extracted before the horse reaches three years of age, and as the permanent teeth quickly appear, the horse bears the marks of being about four years of age, when he is little more than three. Horses under four years of age have seldom adequate strength to enable them to undergo the fatigue of the duty which they may be required to execute.

---

* There is no 5th regiment of Light Dragoons.

The minimum height of troop horses is 15 hands and 2 inches, or about 62 inches. Some allowance is occasionally made for young horses, as it has been found that horses do not always attain their full height until between five and six years of age.

The strength, breed, bone and figure of troop horses are qualities which engage the attention of the regimental veterinary surgeon, whose duty it is, in conjunction with the commanding officer, to approve or reject horses which may be submitted for their examination.

Treatment of Young Horses.—One of the principal objects in the treatment of young horses is to render them docile, and for this purpose great care is taken to make them quiet and tractable, by frequently patting, handling, and rubbing them, and by taking up their feet. They are treated with great gentleness, and led about the barrack yard, where they become accustomed to the sight of mounted horses and the glitter of arms. In the course of four or five months they are generally transferred to the riding school to be trained.

Feeding of Troop Horses.—Each trained horse is allowed daily twelve pounds of hay, ten pounds of oats, and eight pounds of straw, according to the following routine:

Period of the day.	*Oats.*	*Hay.*
Morning, -	3 lbs.	3 lbs.
Mid-day, -	3	3
Evening, -	4	4
Total,	10 lbs.	10 lbs.

The straw is used as litter.

Young horses are fed at the same hours as trained horses, and receive at each feed three and one-third pounds of a mixture of about equal parts of bran and oats, and the same quantity of hay as the trained horses. When remount or young horses are transferred to the riding school, they are supplied with the full ration of oats.

The next object of this paper is to submit some statistical facts in regard to — Regiment of heavy dragoons, for a period of eight years, and, in so far as one corps may serve as a type or symbol of the cavalry in general, the results cannot but be interesting.

TABLE I.—The following table is intended to show the ages of the horses belonging to the Regiment in question, according to the register in 1836 and 1837.

1836.			1837.		
Age.	*No.*	*Yrs.*	*Age.*	*No.*	*Yrs.*
3 years	× 8	=24	3 years	× 13	=39
4 do.	40	160	4 do.	23	92
5 do.	6	30	5 do.	22	110
6 do.	13	78	6 do.	33	198
7 do.	9	63	7 do.	16	112
8 do.	17	136	8 do.	10	80
9 do.	24	216	9 do.	4	36
10 do.	13	130	10 do.	17	170
11 do.	20	220	11 do.	20	220
12 do.	15	180	12 do.	12	144
13 do.	14	182	13 do.	13	169
14 do.	30	420	14 do.	10	140
15 do.	15	225	15 do.	11	165
16 & above	9	144	16 & above	38	608
	233)	2208		242)	2263
Average age,		9½	Average age,		9½

From the above table, it appears that the mean age of the horses is about 9½ years.

TABLE II.—This table will show the amount and the ratio of mortality among the horses, together with the number and ratio of horses cast* (discharged) in consequence of disabilities.

Years.	Strength.	Died.	Ratio of deaths per cent. of the mean strength.	Cast.	Ratio of horses cast per cent. on account of disabilities.	Reduction of horses by death and disabilities per cent.
1830	245	6	2.4 or 1 in 41	16	6.5 or 1 in 15	8.9
1831	256	12	4.6 or 1 in 21	15	5.8 or 1 in 17	10.5
1832	268	10	3.7 or 1 in 27	13	4.8 or 1 in 20	8.5
1833	267	6	2.2 or 1 in 44	20	7.4 or 1 in 13	9.7
1834	250	2	.8 or 1 in 125	20	8.0 or 1 in 12	8.8
1835	248	4	1.6 or 1 in 62	35	14.1 or 1 in 7	15.7
1836	238	10	4.2 or 1 in 24	23	9.6 or 1 in 10	13.9
1837	244	8	3.2 or 1 in 30	26	10.6 or 1 in 9	13.9
Tot.	2016	58		168		
Mean of 8 years	252	7¼	2.8 or 1 in 35	21	8.3 or 1 in 12	11.2 or 1 in 9.

---

[*] To *cast* and to *cashier* may be derived from the barbarous Latin word *Cassare*, and the French *Casser*, to discard, break, disqualify.

This table shows that the average annual strength of the Regiment was 252, the average deaths $7\frac{2}{8}$, the centesimal ratio of deaths 2.8, the mean annual number of horses cast 21, the centesimal ratio of cast horses 8.3, and the mean annual reduction of the regiment by death and casting 11.2 per cent. The annual ratio of deaths was 1 in 35, and the ratio of horses cast 1 in 12, the loss by both deaths and casting being 1 in 9.

TABLE III—Shows the causes of the deaths which took place among the horses during a period of eight years.

	Fatal Diseases and Accidents.	*Died.*
	Disease of the brain, (Staggers,)	4
	Lock jaw, (Trismus,)	2
	Disease of the lungs,	23
	Hydrothorax, (Water in the Chest,)	1
	Disease of the Abdominal Viscera,	3
Shot on account of	Farcy,	3
	Glanders,	6
	Fracture of a leg,	6
	a coffin bone,	1
	a knee (patella,)	1
	the skull,	1
	the pelvis,	1
	the haunch bone,	2
	Injury of the spine by a fall,	3
	Injury by a cart,	1
	Total deaths,	58

From this table it is obvious that affection of the lungs is by far the most fatal disease among cavalry horses. It shows that two-fifths of the mortality has a pulmonary origin.

TABLE IV—Shows the number of horses cast during eight years, together with the disabilities which rendered them unfit for cavalry duty.

Disabilities.	Cast.	Proportion of cast horses to strength.	Mean age of horses cast.	Extreme ages.
Lameness,	67	1 in 30	About 10	3 to 15 yrs.
Worn out,	33	1 in 61	15	10 to 20
Blindness,	22	1 in 91	9	5 to 17
Broken winded,	20	1 in 100	11	8 to 16
Unhealthy constitution,	14	1 in 144	10	7 to 16
Vicious disposition, (chiefly kicking and biting,)	9	1 in 224	9	5 to 12
Slowness of pace,	3	1 in 672	8	7 to 10
	168	1 in 12	10 years	

With respect to the mean age of the horses cast, as stated in the above table, I may observe that it is 10 years; and that the mean age of the horses in 1836 was 9½, and in 1837, 9⅓ years.

Cast horses, although unfit for cavalry duty, may be useful for many other purposes. They are commonly sold by public auction, and bring on an average about L. 8 or L. 9 each.

A few observations may be added in regard to the disabilities of horses; and first, in regard to *lameness*, which is assigned as the cause of the casting of more than one-third of the whole number. Lameness is occasioned by a great variety of diseases of the extremities, especially of the feet, of which the following is a brief catalogue.

1. *Contraction of the foot*, *corns*, *ossification* of the lateral cartilages.

Pumiced foot.—This disability is occasioned by a weakened condition of the sensible lamellæ or of the foot, by which means the coffin bone presses on the sole.

Quittor.—A disability which arises from a wound in the sole of the foot.

Thrush.—A discharge of offensive matter from a cleft in the frog.

Canker.—A separation of the horny from the sensible part of the foot, followed by a fungous growth.

Sand Crack.—A partial division of a hoof from above downwards.

Grease.—A diseased state of the skin which covers the heel.

Splint.—An effusion of osseous matter on the shaft of a bone.

Spavin.—Two distinct diseases are known by this name; *a bone spavin* is an effusion of osseous matter on the bones which form the hock joint: *blood spavin* is an enlarged state of the *bursæ mucosæ* of the hock, by which means the passage of the blood through the subcutaneous veins in the inside of the hock is obstructed, and a soft tumour produced.

Ringbone.—An effusion of osseous matter on the pastern joint.

Curb.—A swelling on the back of a leg about three or four inches below a hock.

Capped hock.—A soft fluctuating tumour on the top of a hock, which is occasioned by an enlargement of some *bursæ mucosæ*.

Wind galls.—Enlarged *bursæ mucosæ* near to the small bones of a foot.

Thorough pin.—A swelling immediately above a hock, which follows inflammation of the *bursæ mucosæ* situated between the tendons of the extensor muscles of the hock, and the flexor muscles of the foot.

2. *Worn out.*—Under this head about one-fifth of the disabled

horses have been cast, the mean age of which was fifteen years, the youngest being ten years, and the oldest twenty.

3. *Blindness.*—Twenty-two horses, or an eighth of the whole number cast, were disabled from defect of vision. The loss of sight of one eye does not render a horse unfit for cavalry duty. Blindness in horses is usually occasioned by cataract, and sometimes, though less frequently, from opacity of the lucid cornea.

4. *Broken-winded.*—Twenty horses, or about an eighth of the whole number cast, were disabled from this cause, which comprehends many of the varieties of disease of the lungs and air passages, namely, *difficult breathing*, *cough*, *roaring*, *whistling*, *high blowing*, *and grunting*.

5. *Unsound Constitution.*—This head comprehends that class of disabilities which prevents horses from being in good condition, and which renders them frequently unfit for cavalry duty. The immediate cause of infirm health and impaired efficiency in horses may depend on a variety of circumstances.

6. *Vicious disposition*, (chiefly evinced by kicking and biting.) —Nine horses have been cast on account of this dangerous disqualification.

7. *Slowness of pace.*—Three horses were cast on this account. This disqualification appears to be congenital.

General Summary.—The mean age of the horses of the — Regiment of Dragoon Guards is nearly nine years and six months. The mean annual ratio of mortality 2.8 per cent., or 1 in 35; mean annual ratio of horses cast 8.3 per cent., or 1 in 12; mean annual decrement of the horses by death and disabilities, 11.2 per cent., or one in every nine horses.

Great care is uniformly taken by the commanding-officer to adopt the means which experience suggests to preserve the health of the horses. They are daily exercised in the open air, under the superintendence of an officer. They are also carefully inspected (dismounted) at regular periods by the commanding officer and veterinary surgeon. Each troop officer attends at the usual stable hours, to see that the horses are properly groomed and fed, as well as to ascertain whether they are in a healthy condition. When a horse is observed to be dull, or appears to be indisposed, the circumstance is immediately reported to the veterinary surgeon, and he is forthwith removed to the infirmary stables.

The advantages of statistical inquiries are becoming more generally known; and in the present state of our knowledge, it is difficult to estimate the benefits which may result to society by a judicious cultivation of this mode of acquiring exact information. Statistical facts are the true and solid basis of all correct views; and without this means of instruction, we can make little progress in an inquiry into the political, civil, and social relations of life. It is by statistical investigations alone that we can deduce correct conclusions respecting the influence of the exercise, the training, the grooming, and the feeding, in other words, the mode of life of cavalry horses; and as it is indispensable that the observation should comprehend large masses, it becomes a question of much importance, whether veterinary surgeons of dragoon regiments should not be instructed to keep correct registers of the sick horses that come under their care, together with an account of the horses which die, and which are cast, both at head-quarters and at out stations, so as to enable them to forward to the proper authorities an annual report of the health concerns of the horses of the regiment to which they belong, along with remarks upon the best means of preserving their health, and promoting their efficiency.

Newcastle-upon-Tyne,
1*st February* 1838.

ART. IX.—*Practical Observations on Chancre.* BY PHILIPPE RICORD, M. D., Surgeon to the Venereal Hospital of Paris, &c. (Extracted from the Bulletin General de Therapeutique Medicale et Chirurgicale.) Translated by GEORGE BELL, M. D., &c.

NOTWITHSTANDING all that has been written on the subject of venereal disorders, it is an indisputable fact, that under the names of venereal and syphilitic diseases, so many different things have been and are still confounded, that, without the exercise of candour as well as accurate observation of complaints reputed identical or very similar, and much precision in distinction, in ascertaining the true characters of disorders really different, they will never be understood, and both confusion and obscurity will continue to prevail.

Whosoever will observe without prejudice or preconceived opinions, the diseases of which we now speak, and the multitude of forms which they assume, which by no means spring from the same causes, possess the same nature, or give rise to the same consequences, will likewise see, that there is one which is always the same, regular even in its aberrations, and which can be discovered by the practised and observing eye, notwithstanding the general obscurity in which they seem involved. This form alone constitutes the disease properly denominated Syphilis, and is that form vulgarly termed Chancre.

Chancre is as distinct from all other diseases, as cow-pox and small-pox are; it is as different from a simple ulceration or ordinary solution of continuity, as the wound of a viper or the bite of a rabid dog are; and it is impossible that any one could seek to deny its existence as a disease *sui generis*, unless through error, bad intention, as the difficulty of a diagnosis frequently troublesome to establish. If, after what I have myself observed, I were to define the syphilitic ulcer of which we now speak, I should take care not to assign to it as constant pathognomonic characters those drawn from its aspect or form. It is because an opposite method has been adopted, that there have been so many grounds of dispute.

I should say, the chancre, or syphilitic ulcer, is a specific ulcer, arising from a cause always special, identical, and of the same nature, under whatever form it presents itself; it is produced by an ulcer like itself, and at a certain stage of its progress can in time produce another; it is a local disease in the commencement, and is the source of that general poisoning known by the name of secondary syphilis.

If we study chancre according to its seat, we find that while it may be situate on any part of the integuments, the mucous membranes are liable only at certain points. This is generally explained by saying, that the least secerning surfaces, and those, therefore, which are least protected by their secretions, are for this reason the most exposed to infection. It would be useless at the present time to detail the particular points in which they are found, but I observe, that since my researches with the speculum, every one is convinced that they are much more frequent in the deep parts of the *vagina*, and the neck of the *uterus*, than was formerly believed. For the truth of this statement I appeal to a comparison between the works of the same authors written before and after my labours.

With regard to causes, dividing them into predisposing and specific, are there idiosyncrasies—as has been maintained, especially after Thomas Rose,—which can resist the infection of syphilis? Can this be concluded, because certain individuals have not suffered effects after having been exposed to causes? It would require, before such an absolute conclusion be established, that the persons considered to possess this privilege should likewise resist inoculation properly performed.

Until these experiments are made, I shall sustain the following proposition, to wit, *that the matter of chancre, taken in the wished-for conditions, and properly applied, will, in every individual, give rise to the development of a chancre.* If any one contradict or disbelieve this statement, let him undergo the test which I propose, and submit to inoculation.

But if the cause of chancre is the matter secreted by a chancre, what are the conditions under which this matter must be taken? What are those under which it must be applied in order to its acting? It is during the ulcerative stage that the chancre produces its specific secretion, its specific purulent matter; after this it loses its character, its nature changes, its poisonous properties are destroyed. The less it is mixed with other substances the more certain is its action.

The matter of chancre can alone produce chancre. If, therefore, a chancre appears after the contact of other matters of secretion, it is because these secretions were mixed with the matter from a syphilitic sore, in proper proportion. It is thus that saliva from an infected mouth, milk from an ulcerated nipple, or sweat from a diseased skin, can transmit the pox. It will never be possible, except through great credulity or a misplaced confidence in the appearances of morality, too often mistaken, to find another original, or to review the story of Cardinal Wolsey, who was arraigned before the House of Lords for the crime of regicide, in as much as he whispered into the ear of the king, and thus exposed his majesty to this dreadful malady by the contact of his impure breath. Neither is the primary venereal disease ever hereditary. In the usual sense of this term, infants never exhibit it at the moment of birth; and if they show it at a later period, it is because the mother was affected with the disease at the time of her delivery; and the infant either then or at a later period came in contact with the diseased organs of the mother.

But, in order that the cause may act, and the disease be produced, is it necessary, as Bru has said, and others have repeated, that certain organic and physiological conditions should exist; that there should be orgasms, electro-syphilism, or sympathetic action between the organ that communicates and that which receives the disease? In a word, is the influence of the genital organs over all that governs these functions an indispensable condition of the disease? No, doubtless, and cool unsophisticated experiment has cancelled at one stroke all the long pages, more or less ably written, in which this position is maintained. Syphilis can perpetuate itself without the aid of the genital organs, and without any difference arising from this, either in its nature or general consequences.

Before a part can be infected, it must be deprived of *epidermis* or *epithelium;* it must not be the seat of an acute inflammation; and the secretion from it must not be morbid, or so abundant as to serve as a protection.

If, in order to obtain these conditions, we take the purulent matter of a chancre during the ulcerative stage, and insert it with a lancet below the *epidermis*, on the inside of the thigh, or any other part of the body, we observe the following to take place.

In twenty-four hours the point where the matter has been introduced becomes red, as after vaccination; on the second or third day, there is slight tumefaction, similar to a small pimple surrounded with a red *areola;* on the third or fourth day, the epidermis is raised by a liquid more or less consistent, and we observe a vesicle with a black speck on its apex, which is owing to the blood effused when the puncture was made; on the fourth or fifth day, the morbid secretion is augmented, it becomes purulent, and there is now a pustule depressed on the summit, which renders it similar to the pustule of small-pox. At this time, the areola, which had been increasing both in extent and intensity, frequently begins to diminish, especially if the disease does not advance; but after the fifth day, the subjacent tissues, which are often, as yet, unaffected, are only slightly œdematous, become infiltrated and hardened by the effusion of a plastic lymph, which gives to the touch a feeling of resistance, or that sensation of elasticity communicated by certain kinds of cartilage. Lastly, at the end of the sixth day, the matter becomes thick, the pustule shrinks, and crusts soon begin to form. If these crusts are not removed, they increase by the base, they become more and more elevated by the secretion of new strata, and assume the form of a truncated cone, depressed at the apex. If the crusts are detached, or fall off spontaneously, an ulcer is exposed, resting on the hard base already mentioned. It extends through the entire thickness of the skin, and its surface, which is of a grayish colour, consists of a lardaceous and sometimes pultaceous substance, which cannot be removed by washing. At this stage the sides of the ulcer, neatly cut out as if with a circular instrument or punch, are nevertheless more or less rough, and present, when examined with a magnifying glass, slight denticulations, and a surface similar to that of the bottom of the ulcer. Their margin is the seat of a degree of swelling and induration, like that of the base, and presents a ring of a reddish-brown or violet-colour, which is more prominent than the neighbouring parts, and the borders of the ulcer being thus raised and slightly turned over, it assumes the common infundibuliform appearance of these sores in the early stages.

Such are the results furnished by more than two hundred experiments, from which we have further deduced the following propositions.

1. The best method of producing chancre is inoculation with a lancet.

2. Inoculation never fails, if the proper conditions are observed, concerning the taking and applying of the matter.

3. The purulent matter, taken from a pustule which has been

produced by inoculation, will likewise in its turn produce a chancre in the same way; and thus we may experiment, with one pustule after another, without any limit, except that which is consequent on a want of skill.

4. When we inoculate in several places with matter from the same sore, so many pustules are produced, succeeded by chancres. Of three punctures we never see one succeed and the rest fail. There are never more and never fewer pustules than correspond with the number of punctures made.

5. Whatever may be the varieties and complications which the inoculated chancre may present at an advanced stage, its progress at the commencement is always what we have described.*

6. There is no period of incubation in the ordinary sense of that term. As regards chancre, only one action takes place, from the time the matter is applied, to that when the ulcer is formed. It is easy to explain the tardy development of certain chancres without having recourse to the doctrine of incubation.

7. Chancre, therefore, is a local disease at its commencement, the first morbid process beginning and finishing in the place that was infected, and never in another.

8. The constitutional infection is probably produced at a more or less advanced stage, which might perhaps be pointed out with greater precision.

9. In order to arrive at a result so important, it is necessary to distinguish between the real and fictitious commencement of the chancre, that is to say, to date the origin of it from the day on which the disease was contracted, and not from that on which the patient first perceived it.

10. By making a series of observations in this way, it will be found, that if the ulcer is destroyed by caustic or otherwise on the third, fourth, or fifth day after the application of the cause, the patient runs no risk of secondary symptoms.

---

* The truth of this statement we have observed in a great number of cases at the Venereal Hospital. It is M. Ricord's practice to test every patient with a sort of tube, who is admitted, and almost all the cases of gonorrhœa are dealt with in a similar way. Hence he is always certain of the nature of the disease he treats, and many urethral chancre is detected, which otherwise would have been the prime cause of disaster to the patient and perplexity to his physician. An instructive experiment was performed in the beginning of last October. A lad, aged 19, was admitted with a small superficial chancre on the part where the mucous membrane is reflected from the *frenum*, slight pain and swelling of a gland in the left groin, and a small abscess on the pubis. Matter from the chancre was inoculated on the inside of the right thigh; inflammation, vesicle, pustule, with characteristic induration took place, when the chancre was destroyed by the nitrate of silver. The abscess was opened, and the same thigh inoculated with the matter without any result, and the abscess speedily healed. The bubo suppurated, was punctured, and the left thigh inoculated with the matter, without any result. The opened tube was poulticed, and the experiment repeated with matter from the bottom of the abscess, when the same events took place as in the inoculation with the secretion from the chancre. For an explanation of this, see note A, at bottom of page 74.—G. B.

11. It will be likewise found, that induration commences about the fifth day; that it is from indurated chancres that secondary symptoms commonly arise; and that this induration seems to be the announcement of the poison having penetrated more deeply into the economy. In so far as induration has not taken place, we may consider the disease as still local.

12. The researches we have made on the inoculation of venereal diseases enable us to say, that the contradictory facts found in authors depend only on an erroneous appreciation of the circumstances under which they experimented, and this we shall prove in a more extensive work.

Chancre, however, does not commonly develope itself in the manner we have described. A mucous or sebaceous follicle is the common seat of disease; sometimes a mechanical lesion, a sore, an erosion, or even an ulcer is the part infected; or the matter of chancre may be carried into a lymphatic vessel or gland, and there produce the same result. It is sufficiently clear that, as the conditions differ under which the cause acts, so will the effects differ in the forms the chancre assumes. These forms may be reduced to three, to wit:

I. Pustules at the commencement.

II. Phlegmon followed by abscess, and succeeded by a true chancre.

III. Chancre, or ulceration from the beginning.

Thus, whenever the matter is placed beneath the *epidermis* or *epithelium*, it will give rise to the first form or pustular chancre, about which there has been so much dispute, but whose existence has been incontestibly established by my experiments.

Again, when the virus penetrates into a mucous or sebaceous follicle,—whose orifice afterwards becomes obliterated—a small tubercular abscess is produced, which afterwards presents all the characters of chancre. The same will take place in the subcutaneous or submucous cellular tissue, if we introduce the matter by the medium of a leech-bite, whose edges, not being inoculated, will afterwards unite. If the matter has passed into a lymphatic vessel or gland, suppuration likewise will occur, and be succeeded by an ulcer of the nature of chancre. The inflammation of the lymphatics and *adenitis* in this case, are one and the same disease, different only in the form of its commencement.

Lastly, whenever the matter is applied to a denuded surface, there will be ulceration from the commencement.

Besides the varieties now mentioned, so important to be known, and from which the observation of physicians has been seduced, by the received idea of the Hunterian chancre, there are other varieties or deviations from the normal form, which, to the superficial observer, seem to be so many distinct diseases. Difference of seat, as the individual conditions, physiological, pathological, hygiēnical, or therapeutical, in which we find the infected persons, will explain these deviations; for they are never inherent in the intimate nature of the cause, the effect of which is always the same at the commencement, whatever its source may have been.

Without insisting on all the irregularities of aspect and form, and speaking of the differences that may exist between the cutaneous chancre, which has always a tendency to incrustation, and that of the mucous membrane, unexposed and protected by its secretion, I deem it important to point out the following forms.

1. *Masked Chancre.*—(Chancre larvé) I have proved incontestibly that uterine chancres, deep vaginal chancres, and those situate within the *urethra*, which are as frequent as they were once considered rare, only give rise to symptoms of *blennorrhagia*, and this virulent kind of *blennorrhagia* at first gives rise to symptoms under which the chancre for the most part remains concealed. I have proved beyond doubt that chancre alone can produce chancre, and that it never can be produced by the mucus or muco-purulent matter of simple gonorrhœa. This fact enables us to detect the incorrectness of the observations, of men or women who communicate syphilis to others, yet declare that they themselves labour under gonorrhœa alone. At the present day, these cases will be regarded as cases of concealed chancre by acute observers; or at most, of chancre which, by reason of its seat, gives rise to symptoms of *blennorrhagia*.

2. *Superficial Chancres*, by which the skin has not been destroyed through its entire thickness. These chancres may or may not be attended with induration, and their borders are more or less raised according to the depth of the ulceration.

3. *Phagedenic Chancres.*—It is the nature of chancre to destroy, but when no complication or untoward predisposition exists, its local progress is soon limited. The limits seem in a certain degree to be fixed by the deposition of the plastic lymph which constitutes the induration, and is one of the most constant characters of chancre, as was first remarked by John de Vigo, and afterwards by Hunter. Beyond certain limits, the increasing ulceration assumes the name of phagedenic, and the different conditions under which this process goes on, allow of the practical establishment of the three following distinct varieties.

1*st. Pultaceous*, *Diphtheral*, *Phagedenic Chancre.*—This variety is analogous in many respects to hospital gangrene. Although in general serpiginous, it also assumes an annular form, rather creeping along the surface, than burrowing among the tissues. Skin, mucous membrane, and cellular tissue, resist it less than other textures, which often happily oppose its progress, and this is the reason why its superficial extent for the most part greatly exceeds its depth. The parts in which these sores are situate generally present but little tumefaction; the swelling is œdematous or phlegmonous, and offers none of the characteristic induration. Secondary symptoms bear no proportion either to the extent or duration of these chancres. We have seen them of great size, and persisting for many months without any consecutive symptom taking place. One patient, among others, had a sore of more than six inches in extent, which followed a bubo in the inguino-crural region, and persisted for fifteen months; and another patient from the country had one ten inches long, which remained for eight months, yet neither of these men had secondary symptoms.

2d, Phagedenic Chancre from excess of induration.—It frequently appears that an excessive effusion, or kind of apoplexy of plastic lymph, causes the death of the part in which it is deposited. The indurated parts become the seat of a kind of molecular, interstitial gangrene, commencing at the surface in the part most distant from the centre of circulation, and afterwards increasing in depth, if the induration be not otherwise dissipated. These ulcers are generally indolent, unless when irritated, and never extend like the others. The induration, indeed, always circumscribes their progress.

3d, Inflammatory, gangrenous, phagedenic Chancre.—In this form the characteristic circumstance is a slough of a gray or black colour. This depends on the tissue affected, and on some other conditions, which do not constitute a difference in nature, as some assert. In this case, the cause of the extension of the ulceration is gangrene from excess of inflammation—a gangrene that differs in no respect from that which is occasioned by ordinary inflammations, and which would not give rise to the admission of a particular variety of chancre, were it not that this mode of extension of ulceration of the chancre is for the most part badly studied, badly understood, and frequently the cause of serious errors. When true gangrene occurs, the chancre is commonly destroyed by the sloughs, and after their removal there remains only a simple ulceration, situate on the tissues, which are more or less infiltrated or phlegmonous. If gangrene, which may be called a good complication, takes place early, no characteristic induration remains, and the patient runs no risk of secondary symptoms.

But though we frequently meet with well-marked cases of these varieties, it will perhaps be found, that they are often combined with one another, and more or less complicated with irritation, sensibility, and pain.

Whatever is the particular form of chancre, let its progress be acute, subacute, or even chronic during the period of increase, a cure nevertheless takes place. The cure may be spontaneous, or, as more frequently happens, under the influence of remedies, and that in a space of time difficult to limit, between three and five weeks, as some have believed can be done; for nothing is more irregular than the duration of this disease.

However this may be, the cure announces itself by the passage from the period of ulceration to that of reparation. The bottom of the chancre presents healthy fleshy granulations, the borders are no longer swelled, but sinking down incline towards the bottom of the sore. Their brownish-red and livid tint disappears, giving place to a whitish or pearl-gray circle; while the areola, if it still remains, becomes more and more circumscribed, and finally vanishes. Cicatrization commences at all parts of the circumference, and tends towards the centre; but when the ulceration has been very extensive, it sometimes begins at many points of the centre and circumference simultaneously. At last the base is absorbed. When the ulcer has been situate on the skin or mucous membrane, and these parts have not been destroyed through their entire substance, the cicatrix is on a level with the surrounding parts. When a small portion only has been absorbed it is more raised. And finally, if the ulceration has occurred in such parts as a gland, or in the neck of the uterus, which contain no cellular tissue, the cicatrix is depressed.

The period of reparation, when the sore is no longer specific or contagious, does not always observe the regularity we have described. It is not uncommon to observe a partial reparation of the borders or bottom of the ulcer, through a third or half of its extent, while the remainder is still in the period of progress; neither is it rare to see ulceration re-attack the parts that had begun to heal from inoculation in the circle of ulceration itself. Chancre is a genuine phœnix, which springs from its own ashes, and furnishes the food for its own nourishment. Other irregularities of this period are observed, which, according to some, should be regarded as distinct species of ulceration. Sometimes the bottom of the ulcer is developed, rises above the diminishing edges of the sore, and, presenting a surface more or less granular and convex, constitutes a variety of the *ulcus elevatum*. When the chancre is raised by the indurated base, it constitutes another variety of the *ulcus elevatum*. At other times, true vegetations succeed the fleshy granulations, and constitute what is called the fungous or vegetating chancre.

Lastly, the chancre may undergo a transformation *in situ*, during the period of reparation, and become a secondary symptom, assume the characters of that class of ulcers, or be converted into mucous tubercles or pimples. The edges may remain callous after complete cicatrization has taken place, and this induration, which leaves the cure imperfect, merits the greatest attention.

ART. X.—*Experiments and Observations on the Medicinal Properties of Euphorbium.* By PAUL D. VEITCH, M. D.

THE EUPHORBIACEÆ is a natural family of plants of considerable interest to the physician, as it contains the genera *Ricinus*, *Croton*, &c. from which the valuable castor and croton oils are obtained.

The family has received its name from the genus Euphorbia, whose different species are met with in all parts of the world, and it is one of great importance, as they all contain a milky, acrid juice, possessing active properties, either when applied externally, or taken into the stomach. One of the European species, the *E. Lathyris*, has lately been employed in medicine, by Calderini * of Naples, and others, as a substitute for the croton oil, but has not been generally used.

The whole of the European species are worthy of our attention, as cases of poisoning from their improper use are to be met with in different medical works; but I intend confining my observations to the Euphorbium of the shops, as being of the greatest activity, and better known than the other species.

It is still uncertain from what species the Euphorbium of commerce is obtained. Linnæus thought we should be supplied from the *E. officinarum*. This plant is a native of India, and the Cape of Good Hope, and the London College have adopted it; whilst the Dublin College have placed the *E. Canariensis* in their pharmacopœia, and this species was believed by Miller † and the late Dr Duncan, ‡ to be that from which this country is supplied. It is a native of Barbary and the Canary Islands. The ancients are believed, however, to have used that obtained from the *E. antiquorum*, a native of Egypt, Arabia, and the East Indies, and it is said the Euphorbium still imported by the Dutch is got from this species.

Those plants grow from four to twenty feet and upwards in height, have generally a thick, succulent, angulated stalk, are commonly destitute of leaves, and are mostly armed with crooked spines. The *E. officinarum* was introduced into this country about the year 1597, and frequently flowers in hot-houses.

Euphorbium is the concrete juice of those plants. The manner of collecting it is very interestingly described by Dioscorides,§ who says that the euphorbia is a ferulaceous tree growing in Lybia and Mauritania, full of a most acrid juice, which the timid inhabitants collect (on account of its great acrimony,) by suspending receivers on the tree, made of the washed stomachs of sheep, and then wounding it with spears from a distance above the receivers, which being done, the copious juice immediately flows as if from a broken vessel, and it is even sometimes projected on the ground, so great is its impulse. Dr Duncan refers to Mr Jackson's Account of Morocco for a description of the manner of collecting it at the present time. He says, "the inhabitants of the lower regions of Atlas make incisions into the branches of the plant with a knife, a corrosive milky juice issues, which, after being heated by the sun, becomes a substance of a whitish yellow colour, and in the month of September drops off, and constitutes Euphorbium." The plants produce abundantly only once in four years. "Dioscorides[*] describes two kinds of euphorbium, the one, he says, transmits light, like sarcocoll, which grows in pieces about the size of the seed of the tare; the other, having been collected in the receivers, concretes into a mass of a vitreous appearance. Euphorbium, he adds, is adulterated with sarcocoll. This substance, as at present met with in the shops, is found in roundish masses, of a dirty pale yellow colour, opaque, often perforated with small round holes, and is generally mixed with a large quantity of impurities, as the spines and seeds of the plant, portions of the stalk, earthy matter, &c. &c. Its specific gravity, according to Dr A. T. Thomson, is 1.1244. It has no smell, it burns with a bright flame, and emits an agreeable odour; it has little or no taste, but on chewing it there is soon felt a strong burning sensation on the palate and tongue, extending to the throat and pharynx. The tincture is, however, decidedly bitter at first. It is in general very friable and easily reduced into a powder; but I have sometimes found it get pasty in the mortar, and to prevent its doing so, it is frequently dried before the fire, by which it is apt to be injured.

---

* Dictionnaire Universel de Matière Medicale par. F. V. Merat et I. de Lens, Tom. iii. p. 182.

† Gardener's Dictionary, edit. 6.

‡ Edinburgh Dispensatory, edit. 12, 1830.

§ Dioscorides P. de Nat. Medica, lib. 3, chap. 88, Colon. 1529.

The people who collect Euphorbium, as well as those who reduce it to powder, are obliged to tie a cloth over their mouth and nostrils, to prevent the minute particles from getting into them, as it causes incessant sneezing; and Geoffroy[†] adds, "often hemorrhage and sometimes inflammation of the brain," on which account, he says, skilful pharmacopolists employ rustics and men of low condition to pound it.

Euphorbium has been analyzed by many chemists with very different results. Braconnot[‡] found it composed of resin, 37.0; wax, 19.0; malate of lime, 20.5; m. of potash 2.0; woody fibre, 13.5; water and volatile oil, 5.0; loss 3.0 = 100. Pel-

---

[*] Loc. cit.

[†] Tract. de Materia Medica, auctore S. F. Geoffroy, Vol. ii. p. 626, 1741.

[‡] Dictionnaire des Drogues.

letier* got resin, 60.80; wax, 14.40; malate of lime, 12.20; m. of potash, 1.80; woody fibre and bassorin, 2.00; water and volatile oil, 8.00; loss 0.80 = 100.

But the most complete analysis is by Brandes, who got resin, 43.8; cerine, 13.7; myricine, 1.2; caoutchouc, 4.8; malate of lime and potash, 23.7; water, 5.4; lignine and impurities with a little sulphate of lime, potash, and gluten, 5.6 = 100.

The difference of those examinations is very striking; but I believe that the differences in chemical analyses, not unfrequently arise from chemists taking the substances in very different degrees of purity. In purchasing euphorbium, for example, it is to be recollected, that, if we take the powder, the impurities are all mixed with the real substance, whereas in taking it unreduced, we generally will select the fine pieces, and reject the whole of the impurities; and in a substance like the one in question, where the impurities are very great, we can expect nothing but contradictory statements both by the physician and chemist, unless they mention precisely what they are examining. In the above analysis it will be observed that Braconnot got 13½ per cent. of woody fibre, whilst Pelletier got only 2 per cent. of woody fibre and bassorin. And it may be stated, that we can put no confidence in any powder as it is met with in the shops.

As Euphorbium contains no gum, it has been improperly called a gum resin. Kastner, Duncan, and others, have denominated it a saline waxy resin. The active principle is the resin which is taken up by alcohol, ether, acids, alkalies, and in small quantity by the volatile acids; Paris † and others have named it Euphorbin.

Medicinal Properties.—When euphorbium is taken in large quantities, it acts as a powerful acrid poison, and causes violent inflammation and ulceration of the stomach and bowels. Those effects were known in the most ancient times, as the following quotation will show, although many writers have stated that they did not employ it internally in those periods:—‡ "Serapio et Avicenna observant drachmarum trium pondere haustum, potantem interficere, trium dierum spatio, erosis ab eo intestinis et ventriculo."

Cases of poisoning will be found in the Philosophical Transactions for the year 1760, and in the works of Beck, Christison, and others. Orfila § performed experiments on dogs with this substance, both by introducing it into their stomachs and into wounds. The symptoms and the appearances after death are mentioned. Its effects on man and the lower animals appear to be similar.

---

* Dictionnaire des Drogues.

† Paris's Pharmacologia. edit. 5. Vol. ii. p. 188, 1822.

‡ Mat. Med. S. F. Geoffroy,

§ Orfila, Toxicologie Generale, Tom. ii. Paris, 1818.

But although it produces inflammation and ulceration in large doses, it was very much employed by the ancient physicians as a hydragogue cathartic in small quantities.

As I do not wish to lengthen this paper by entering minutely into the manner in which it was combined with other medicines, and an enumeration of the diseases in which it was given, I shall content myself with referring those curious on this subject to the writings of Aetius, Paulus Aegineta, Trallian,[*] and others, and in more recent times to the works of Cæsalpinus,[†] Schroeder,[‡] Geoffroy,[§] Alston,[||] &c. &c.

I shall merely add, that Euphorbium will be found in a great number of the prescriptions of the most ancient of those writers, and quote a single prescription from Trallian, which he calls "medicamentum ex myuro herba."[¶]—"Sii herbæ, agarici, myuri herbæ singulæ unciæ, dantur scrupuli quatuor, misceatur potioni una vice dandæ, scrupulus euphorbii, ac exhibeatur cum maleo, aut chrysattico generoso;" but it will be found exhibited in larger doses in other parts of his work. Among the later writers to whom I have referred we still find it employed, but not so frequently as by the more ancient; and Ettmuller,[**] Hoffman, and many others advise us to abstain altogether from using it internally, or at all events only in those cases where there is paralysis of the intestines, apoplexy, palsy, lethargy, &c. where the bowels can only be moved by powerful and irritating medicines.

Geoffroy says, it is the most acrid and burning of all the hydragogue cathartics; so that it does not purge without distress, fainting, and cold sweats, and often ulcerates the intestines. The twigs boiled in water, he adds, are useful in gouty pains. Alston[††] and others say it is too virulent for inward use. Dr Ainslie[‡‡] mentions that the recent juice of the *E. antiquorum*, a little diluted with water, is used by the native practitioners of India, as a purge in obstinate constipation.

The dose of this drug has been variously given. Many of the ancients gave it in doses of a scruple, and often in combination with other active substances. Ettmuller also talks of giving the same quantity; Schroeder from five to ten grains; Geoffroy to the extent of eight grains; and many others from two to three grains.

---

[*] Alexandri Tralliani, Med. Libri. Lugduni, 1560, Lib. xi. page 662.

[†] Artis Medicæ Hippocraticum. Frankfort, 1605.

[‡] Pharmacopœia Medico-Chemica. 1672.

[§] Loc. cit.

[||] Alston's Materia Medica, Vol. ii. 1770.

[¶] It is a curious circumstance, that in many of Trallian's prescriptions for gout we find the Hermodactylus, which has been proved to be a species of *colchicum*, the *C. Illyricum* of Linnæus. The older writers used the hellebores, which also contain the same active principle as the Hermodactylus, and which has been found so beneficial in the same diseases in recent times. I may add, that the above-mentioned fact was proved by Lobel, Matthiolus, and lately by Sir Joseph Banks. The French describe the plant under the name of *Colchique Hermodacte*. I would refer the reader for further information on this interesting subject to Sir G. Blane's Select Dissertations, and the Cours d'Histoire Naturelle Pharmaceutique of M. Fée.

[**] Opera omnia Michialis Ettmulleri. 1702.

[††] Loc. cit.

[‡‡] Materia Medica, Vol. i. p. 124. 1826.

From having found the euphorbium useful when applied externally, and from its belonging to the same natural family as the Croton Tiglium, it occurred to me that it might prove useful as a substitute for the croton oil, in small doses; more especially as other medicines, which the ancients thought too virulent for common use, are daily exhibited, as the elaterium, gamboge, &c.

For the purpose of satisfying myself on this point, I resolved to take a few doses. This was done during the day, for greater certainty of watching its effects. The quantity taken was from three to ten grains, and this repeatedly. It occasionally caused slight pains in the bowels, confined to a small spot, but never either any vomiting or purging, and the pain when produced soon went off. I then gave it to others, but never more than six grains. Some of them said it caused pains, others that it had no effect, and others that it purged. This was slight, and it did not appear to be caused by the medicine.

Different specimens were tried. They were all active, when applied externally after removing the cuticle; till, having one day taken six grains of a finer and fresher specimen than the others, it caused a very severe pain at the pit of the stomach, and great tendency to faint, but no vomiting or purging. I did not, however, think it prudent to repeat the experiment.

The conclusions I drew from those trials, as well as from the writings of others, were, that there is very little chance of its ever being brought into use as a purgative, as it causes sometimes great irritation of the stomach and bowels, and might prove injurious in those constitutions where the mucous membranes are naturally irritable, but that it does not act so powerfully and certainly as a purgative as we were led to believe; and if we were to administer it as a purgative, we would be obliged to give the large doses as used in the time of Paulus Aegineta, Trallian, &c.

Euphorbium has been applied externally from very ancient times. Dioscorides says, that it removes suffusions of the eyes, and removes plates of bone the same day it is applied. P. Aegineta and Trallian used it very often. The latter mentions an ointment used in gout, prepared from this substance, which he says is "vehementer bonum."

Ointments were made with it, and applied in most deep-seated pains, and, according to Dr Ainslie, the natives of India still employ the fresh juice of different species of Euphorbia in similar cases. It has been very much praised for removing caries of the bones by Hildanus, Ettmuller, Wiseman, Heister, Geoffroy, and others; and as it has been recommended by so many writers, it might be worthy of a trial in those cases, as a potential cautery. It is proper to mention that in those ointments where it was employed by the ancients, it was generally combined with other active substances; so that it is difficult to ascertain how much of the effect is due to the Euphorbium. The ointment I have alluded to as employed by Trallian has turpentine and nitre combined with it. He praises it very highly; and with regard to its effects he says, "summam cutem discutit et vellicat, trahitque ex alto quae impacta sunt, et discutit, dolorem excindit, et quod omnium optimum est, manus non inquinat et sine molestia aufertur." He has found, he adds, much benefit from the Euphorbium alone, boiled with oil and wax, and says "et mirari non debemus, quod Euphorbium, cum sit adeo calidum et rodens, commendemus, tanquam dolores lenire possit."

Pyl * relates a case where a man was prosecuted for putting the powder of Euphorbium into his maid-servant's bed, where it is said, it caused great itching, pains and violent inflammation of the bladder, and swelling of the feet followed. Many writers, as Geoffroy, Alston, &c. say that when applied, it causes inflammation of the skin. And many state that it produces vesication when applied to the sound skin; among whom I may mention Orfila, † the author of the Dictionnaire des Drogues, Devergie, ‡ Merat, § &c. It is much to be desired that it should produce those effects, as we might get rid of the cantharides as a plaster, for they are both expensive and troublesome; but in all my attempts to produce blistering, I have failed. The dry powder was tried, the powder mixed with water, without effect; the alcoholic tincture, the solution in acetic acid only produced slight redness. I tried an ointment of two drachms of the powder to the ounce of lard, thinking it might act like the croton oil, or tartar emetic ointment; it sometimes caused a papular eruption, and in two cases only, a pustular, and in these the skin was very tender, from long continued blistering.

The blistering ointment employed by veterinary surgeons is composed of Spanish flies, turpentine, and Euphorbium generally, but it is very probable that on the irritable skin of the horse, the turpentine and flies alone would cause vesication.

From those trials, as well as from daily seeing cases where the Euphorbium is applied to keep up a discharge from blistered surfaces, without the smallest bad effect, I am inclined to think that in Pyl's case, it must have been the powder of Spanish flies which was used; if the Euphorbium caused inflammation of the bladder, we must surely have met with cases, as it has been employed in the

---

* Murray's Apparatus Medicaminum, Vol. iv. Christison on Poisons.

† Toxicologie General.

‡ Medecine Legale, Tom. ii. partie seconde, p. 796, par Robicourt.

§ Dictionnaire Universel de Mat. Medicale, par Merat et I. de Lens.

same person for weeks together, as an issue ointment, in the Edinburgh Eye Dispensary for nearly three years.

The last way in which I tried the Euphorbium was as an issue ointment, in which mode of application it is very useful. This ointment I was led to suggest to the medical officers of the Edinburgh Eye Dispensary, from having seen it used in veterinary surgery, and reflecting on its belonging to the same family as the croton tiglium, whose oil forms an excellent counter-irritant. The other issue ointments are all objectionable. The objections I will by and by mention. Suffice it to say, that three years have now elapsed since it was introduced into the Eye Dispensary, and has, I believe, completely superseded the other ointments of this description. As I before mentioned, I do not know any bad effects which it is apt to produce.

It is used in the proportion of twenty to twenty-five grains of the powder to each ounce of lard.

The advantages which it has over the other ointments, are, its being very cheap, a circumstance in public institutions of great importance, and it has, I believe, considerably reduced the expenditure of the Eye Dispensary, where blistering and a long continued discharge from the blistered surface are so generally required. The difference of price, however, between the above ointment and the savine is not altogether due to the substitution of euphorbium for savine, but also to lard being used in place of simple ointment, which forms the basis of most ointments. The apothecaries seldom, however, make the ointment according to the pharmacopœia, but take lard, in which they boil a little white wax to harden it, which makes a better and cheaper ointment than that of olive oil and wax.

An advantage of the Euphorbium ointment is the ease with which we can strengthen or weaken it, in cases where it may be required, which we cannot do with the savine, and which generally soon ceases to cause irritation. The Euphorbium can be had in all climates. The objections to the two ointments of cantharides are their being apt to cause strangury, and they are often inert, the flies being spoiled by being too much heated, or being kept in a damp place.

The savine ointment is difficult to prepare; it is often inert; it is expensive; it is not found in warm climates; and I have sometimes known it contain a large quantity of acetate of copper, which is used to colour it, especially when it has lost its colour from long keeping; and which must surely do mischief, when long applied to an open sore, especially in children. Besides, the substitution of the Euphorbium for savine may allow of the latter being banished altogether from the pharmacopœia, (as it is only used to make the ointment), which would leave no excuse for the apothecaries keeping it, by whom it will otherwise continue to be sold, and thus afford the instrument for the execution of those criminal offences for which it has so long been famous.

8, *Hart Street*, 3d *March* 1838.

ART. XI.—*Case of Anthracosis or Black Infiltration of the whole Lungs.* By THOMAS STRATTON, M. D.

THE interesting appearance, of which the following case is an instance, was first described by the late Dr J. C. Gregory in 1831, and since that time several cases have been recorded.

On examining the bodies of elderly persons, we find the lungs always of a dark colour. Sometimes this colour is much deeper in various parts of the lung, which then are as black as charcoal; at other times the whole lungs are uniformly of this charcoal colour.

The first appearance is considered healthy; the second receives the name of melanosis; and the third is what has been called the black lung of coal-miners, and may more shortly be defined *anthracosis*, (*ανθράξ*, charcoal.)

On September 29th 1837, I was invited by Dr Crawford to witness the inspection of the body of a patient to Dr Leitch. The history of this patient is as follows.

George Harrison had worked in a coal-mine for fifty years; at his death, he was aged 70; for the last four years he has been an inmate of Tynemouth Workhouse; he had not worked in a coal-mine for some time previously. For some years before his decease, he has been affected with symptoms of chronic *bronchitis;* the *dyspnœa* was not considerable; his expectoration was small in quantity, and never of a black colour. There was mucous rattle more on the left than the right side of the chest. On percussion, the sound was natural. Latterly he complained much of pain in the right hypochondrium, and had dropsical symptoms in the abdomen and inferior extremities.

Inspection.—Thorax.—On the left side the *pleura pulmonalis* and *pleura costalis* were connected by extensive and firm adhesions. Both lungs uniformly presented a perfectly black appearance externally and when cut into. A portion of them rubbed on the hand left a black stain, which was with some difficulty washed off, and a bit put into water gave it the colour of china-ink. Throughout both lungs were seen and felt hard masses of black matter from the size of a bean downwards. These masses were more numerous in the central parts of either lung, and also were in greater abundance in the central part of the left than of the right lung. In the left lung were several chalky bodies, encased in this black substance. No black substance was found in the bronchial glands. Nor was black matter seen in any other part of the body which was examined.

The heart was natural.

Abdomen.—A considerable quantity of fluid was found within the cavity of the peritoneum. The liver and spleen were much diminished in size. The kidneys were healthy.

Harrison's lung I compared with that of another subject, formerly a man-of-war's man, aged 72. This lung was very much lighter in its colour than Harrison's, and did not leave a stain when rubbed on the hand.

It is proper to mention that the coal-miners in this district do not use a lamp attached to the forehead as they do in the west of Scotland.

On the left side there was a greater number of black bodies, more pleural adhesion, and more *bronchitis* than on the right side. It is interesting to observe that these three conditions existed together.

If we suppose the matter of the anthracosis to have been inhaled by the man whilst at work in the mine, and that during the five or six years that he discontinued this kind of work, the lungs were endeavouring slowly to relieve themselves of the foreign matter, then the obstacle to free action of the left lung from pleural adhesion, and the smaller quantity of air which could be admitted along the left bronchial tubes thickened by inflammation, and partially obstructed by mucus, will explain how the anthracosis had become less in the right lung, when these states existed in a much less degree.

If the difference in the quantity of anthracotic matter in the two lungs is not to be explained in this way, then, either, more inhaled black matter has been originally received by the left lung or the function of the elimination of carbon has been less imperfectly performed in the right than in the left lung. With respect to black expectoration in cases of *anthracosis,* I may refer to the instructive paper by Dr William Thomson, in the London Medico-Chirurgical Transactions for 1836, and of which a short account was given in the last Number of this Journal (January 1838, p. 260.)

Dr Cumin's patient (Ed. Med. and Surg. Journal, Vol. xlii. p. 324.) appears to have been affected with *phthisis pulmonalis,* complicated with anthracosis, as phthisis sometimes is with melanosis. Dr Laurie's and Dr Buchanan's cases (ib. pp. 328, 329,) prove the existence of anthracosis without the slightest pectoral affection. Dr Buchanan's case of Lyall seems to have been anthracosis along with peritoneal melanosis.

Melanosis of the lung appears to differ from *anthracosis* in the following particulars. *Melanosis* exists in isolated portions, while *anthracosis* is general over the lung. Of melanosis, the local effects are dyspnœa, cough, which is often dry, but sometimes attended with mucous expectoration, and mixed with some puriform sputa, while anthracosis may exist without any chest symptoms whatever. Of *melanosis,* the most constant constitutional symptoms are the gradual diminution of the vital powers, and diminished nutrition followed by hydropic affections, whereas anthracosis often is unexpectedly found to be present when death has occurred from other causes. In *melanosis,* black deposits are generally found in other parts of the body besides the lungs, whilst anthracosis is met with in these alone; and lastly, the matter of melanosis loses its black colour when treated with chlorine, (Dr Henry,) whereas the matter of *anthracosis* retains its colour when so treated (Professor Christison.)

October 1837.

PART II.

CRITICAL ANALYSIS.

ART. I.—*Leçons de Clinique Medicale Faites à l'Hotel-Dieu de Paris.* Par le Professor A. F. CHOMEL, Recueilliés et Publiées sous ses yeux Par J. L. GENEST, D. M. P., Ancien Chef de Clinique Medicale de l'Hotel-Dieu de Paris, &c. (Fievre Typhoide.) Paris, 1834. 8vo. Pp. 548.

IN the forty-eighth volume of this Journal we gave a view of several of the facts collected, and the doctrines taught on the nature of that form of fever denominated abdominal typhus by the German physicians; and we endeavoured to consider what evidence was furnished by the facts to uphold the opinion, that abdominal typhus is a peculiar disease, distinct from the ordinary forms which the disease presents in this and other countries. The present work is entitled to the particular attention of the pathological physician, as one which contains a great number of important facts, which may, in judicious hands, be applied to the illustration, and perhaps to the determination of the same question. M. Chomel, indeed, at the very commencement of the present volume, virtually destroys all distinction between typhous fever in general, and that form which has been named abdominal or intestinal typhus; and he even goes so far as to say, that all the various forms assumed by severe continued fevers, whether known by the specific names of inflammatory, bilious, mucous, adynamic, ataxic, and slow nervous fever, are merely varieties of one and the same disorder, which has received different denominations. To this disorder he proposes to apply the general name of typhoid fever, a distemper in consequence of the analogy which its symptoms present to the Typhus of Camps, *Typhus Castrensis*, *Pestis Bellica* or Kriegspest, of which he regards inflammatory, bilious, mucous, adynamic, and ataxic fevers, as varieties, and to which also he refers the disorders described under the name of *entero-mesenteric fever* by MM. Petit and Serres; under that of intestinal *exanthema* or eruption by M. Andral; *dothinenteria* or *dothinenteritis* by M. Bretonneau; *ileo-colitis* by M. Bally;

and follicular *enteritis* by several other pathologists; in short, the abdominal or intestinal typhus of the German physicians.

Though it cannot be denied that this early announcement of his views is, if not a presumption of the question to be proved, at least a premature statement of one of the conclusions to be demonstrated, and therefore not a very philosophical mode of commencing the inquiry, yet, perhaps, it is less liable to objection than it would otherwise be, when it is remembered, that by thus explaining himself at the beginning of his sketch of the disorder, he gives the reader an opportunity throughout of observing to what extent his history of the progress and terminations of the disorder, and of the forms which it presents, tend to confirm or refute the hypothetical statement made in the commencement. There are, however, two other circumstances which M. Chomel conceives are of considerable force in justifying this proceeding. The first is that, however dissimilar the varieties of this disorder may appear in the symptoms which they present, they present nevertheless certain common characters, which show that they are all very closely allied; in some instances the symptoms ascribed to the inflammatory or the bilious forms of the disorder are converted into adynamic or ataxic symptoms; in others symptoms belonging to different orders of fevers, as distinguished by Pinel, are found to take place simultaneously in the person of the same patient; and in all the progress of these fevers is much the same, or presents the same phases, and within certain limits their duration is either similar or the same. The second circumstance is the fact, that, in the varieties of this disorder is observed a series of anatomical lesions which are observed in no other disorder, and that these lesions are almost uniformly the same in every variety of the distemper. The typhoid disorder, therefore, M. Chomel infers, is the more important, in so far as it must occupy, in nosological arrangement, the place of a whole class of disorders.

We shall now see to what extent the views here stated are well founded, by a short abstract of the delineation traced by M. Chomel.

The typhoid disorder may be distinguished into the preliminary or invading stage, the first period, the second, and the third.

Typhoid fever does not uniformly come on in the same manner. Though in a certain number of cases the symptoms peculiar to the attack are preceded by preliminary phenomena, most frequently the attack is sudden, and comes on unexpectedly amidst appearances of the best health, and without any preliminary indication.

The attack is, on the other hand, sometimes preceded by different derangements, in the functions of relation, similar to those which take place in other serious diseases, especially the eruptive disorders.

Occasionally there is observed a change more or less striking in the expression of the countenance, which becomes sad and as it were sunk, with diminished aptitude for intellectual labour. For some weeks or some days only the strength is sensibly impaired with emaciation; the patient is much more easily fatigued than usual; all his senses lose part of their delicacy and power; he is restless, and feels that he is threatened by a formidable disorder; he feels general uneasiness, pains in the limbs, and at the same time sometimes total loss of appetite, with a pasty feeling in the mouth; in some cases diarrhœa appears and then subsides, though it may afterwards return; the urine is thick and emits a fetid smell; and sometimes squeamishness or vomiting are prominent complaints. In one case the first approach of the disease was indicated by a sort of epileptiform fit.

In order to communicate some idea of the comparative numbers of cases in which the disease is preceded by symptoms, and in which it comes on without previous warning, he mentions that in 112 instances of persons attacked with fever, admitted into the clinical wards of the Hotel Dieu for five years, and of which in this particular accurate notes were kept, in 73 cases, or four-fifths, the attack of the disease was sudden, and in 39 cases, or rather more than one-third, it was preceded by premonitory symptoms.

No distinction can be recognized in the intensity of the attacking symptoms in these two orders of cases. The most frequent prominent incipient symptom is intense headach, felt generally in the act of moving or attempting to rise; and in some instances, though less frequently, the attack is preceded by diarrhœa, in which case the expression is rapidly changed. In some instances, that degree of stupor which some authors represent to belong to the advanced stage of adynamic fevers is already distinct and conspicuous. The muscular energy is always much impaired; and, however the patient may struggle to go on with his usual duties, he feels himself compelled to desist, from an overpowering sensation of lassitude and fatigue, which obliges him to seek the horizontal posture and rest. If he attempts to walk, he totters or staggers like a person intoxicated. When patients are interrogated by what means they came to the Hotel-Dieu, the almost uniform answer, not excepting those who come immediately after the first symptoms, is "in a carriage, or supported by two companions, for I am unable to walk."

Diarrhœa is one of the most important of the incipient symptoms. In the majority of cases it appears on the first or second day, sometimes at a later period from the attack. At the same time abdominal pains are felt, and may in some cases complete the diagnosis of the disorder.

The symptoms now mentioned are those which constitute the incipient or invading period of typhoid fever. Though others might have been added, most usually these appear in the course of the disorder. To trace this course in a more perspicuous and accurate manner, M. Chomel distinguishes the disease into three stages or periods, each distinguished by different phenomena, and the duration of each of which is sufficiently circumscribed, to justify the application of the epithet of septenary, not because each period is always confined to the space of seven days, but because in the simplest and most favourable cases, and in those in which, accordingly, the disease is believed to observe the most regular progress, it is generally in this space of time that the symptoms peculiar to each period are observed to appear. In adopting this distinction into periods, M. Chomel follows the example of Hildenbrand, who, in his account of the contagious typhoid epidemic of Germany in 1812 and 1813, made the same distinction of the periods of regular typhus, and afterwards, in his *Institutiones Practico-Medicæ*, completed by his son, Francis Hildenbrand, from the elder Hildenbrand's papers,—in which the course of the disease is distinguished into four periods or stages.

I. SEMIOGRAPHY. *First Period.*—The symptoms represented by M. Chomel to appear in the first septenary period are headach, then feebleness and stupor, diarrhœa, *meteorismus*, or tympanitic swelling of the belly, sensibility of the abdomen, especially in the right iliac region, a sense of fluid gurgling on pressure of the lower half of the belly, epistaxis, and lastly the eruption designated *typhoid*. These symptoms, however, appear at different intervals from the commencement.

In the first septenary period, the change in the features and expression is striking, and presents a character of listlessness and indifference. The answers of the patient to questions show that intelligence is considerably affected; but reason is seldom impaired, and delirium rarely ensues before the beginning of the second, or at least the concluding days of the first period.

Sleeplessness, either partial or complete, is also a very common symptom in this stage; but though the patient feels that he does not sleep, he lays in a state of apparent inconsciousness of external objects, but has disagreeable dreams, and sometimes starts up. M. Chomel represents this state to be the same which pathologists have termed *coma vigil;* we conceive erroneously. This is the mere *agrypnia*, watchfulness or sleeplessness of the early stage of fever, and is a much less intense form of disease than the *coma vigil*. In the latter there is a greater degree of stupor, or inattention to external objects; yet the patient neither falls into complete and quiet sleep, nor does he possess a sufficient degree of wakefulness to take cognizance of either his own sensations, or other circumstances. He, on the contrary, often mutters and speaks to himself apparently, from which it may be inferred that his own memory or fancy presents to him various objects on which he thinks and speaks, and is thereby prevented from sleeping.

The dryness and viscidity of the mucous membrane of the mouth is a remarkable and constant feature in typhoid fever. At first the salivary secretion is merely diminished, then seems to be suspended, and the whole oral mucous surface is covered with a viscid glutinous coating, which is the product of the mucous membrane in the morbid state. This dryness is generally complete at the close of the first stage of the disease. In a few cases M. Chomel observes the mouth continues moist during the whole course of the disease.

Diarrhœa is one of the most frequent symptoms of the first stage of the disorder, and is observed in different degrees in almost all the cases. In some cases it takes place only at the beginning of the second stage. It varies in relation to the number of evacuations, and the nature of the discharges.

In the first peculiarity it presents all possible degrees, from a single liquid stool to fifteen or twenty in the course of twenty-four hours. In the majority of cases, however, the motions are from four to eight daily. As to the nature of the discharges, sometimes they are quite liquid, and at the bottom of the vessel are a number of small yellowish masses, evidently tinged by a little bile; in other cases they contain matters less liquid, of a yellow, inclining to black, and very fetid. In the latter variety, which must not be confounded with black diarrhœa, when the colour is owing to admixture of a certain quantity of blood, which appears to have undergone incipient digestion, and is frequently observed in the following period, the stools are greatly less frequent than in the first sort, in which they contain only rarely mucous matters, and are never attended with tenesmus or acute colicky pains. Most usually, indeed, the patients do not complain after one or two days. Sometimes also towards the close of the first period, under the united influence of great debility and marked stupor, the matters flow into the bed without the consciousness of the patient, and without his being capable of preventing them.

In some cases, from the first days of the disease, the belly, without increasing sensibly in volume, emits when struck a clearer sound, which is caused by the presence of air within the intestines. Afterwards it assumes a convex shape, at first in the supra-pubal region, where percussion shows the existence of meteorismus, before it can be perceived by inspection.

If *meteorismus* has not been observed by the authors who have given the history of epidemic fever during the last century so frequently as in the present time, M. Chomel thinks it must be imputed to the circumstance, that they did not examine the belly with the necessary care. Though this symptom, indeed, can seldom be distinguished at first sight or by mere inspection, it is in the greatest number of cases cognizable by percussion ; and hence he thinks it is not wonderful, that at the period, when this method of examination was little used as a means of diagnosis, little attention was paid to slight *meteorismus ;* and he thinks that in this manner he can explain the fact, that Tissot observed in the epidemic fever of Lausanne, only three cases in which there was *meteorismus.*

We willingly allow that where percussion is not practised, it is difficult if not impossible to recognize slight degrees of meteorismus. But this very circumstance, with another immediately to be noticed, shows that the explanation given by M. Chomel cannot be the true one. The circumstance to which we allude is this, that though it was perfectly well known that *meteorismus*, or distension of the intestinal tube with air was a symptom of fever, yet it was not to slight or imperceptible degrees of the symptom that the name of *meteorismus* was applied ; and it was only when the belly was sensibly distended and elevated, that it was said, in imitation of the language of the Grecian masters, to be meteorized, [μετεωριζω, *in altum tollo,*] or to present the peculiar elevation or visible distension denominated *meteorismus.* This elevation did not usually take place in the early stages of fever, and when it did take place, was observed chiefly in the latter stages, and was always regarded as an unfavourable and sometimes as a fatal symptom.

Another symptom connected with that of *meteorismus*, and on which M. Chomel observes, with greater justice, that the older authors have been silent, is the sense of fluid gurgling caused by pressure with the hand on the lower part of the belly, and especially on the right iliac region. This phenomenon, induced probably, he thinks, by the concurrence of the simultaneous presence of gases and liquids within the intestines, and the peculiar disposition, perhaps also the pathological state, of the ileo-cæcal valve, he thinks, is as rare in other diseases as it is common in typhoid fever. It is observed sometimes during the first period, but most frequently in the course of the second or even of the third.

The sensibility of the belly is further one of the points claiming the attention of physicians. Appearing at the commencement, and even sometimes preceding the diarrhœa, it is not uniform either in the degree of its intensity, or in its seat. It is seldom acute, and in some instances the patient complains of it only under the influence of considerable pressure. In its locality it presents numerous varieties. Thus in some patients it is exclusively confined to the right iliac region; in a larger number it occupies the whole hypogastric region; while in others it ascends to the epigastrium, whence it occasionally extends over the whole belly; and in the latter case it is connected with a state of soreness or general uneasiness either of the neighbouring parts, as the chest, the kidneys, the back, or even the whole surface of the body.

The state of the general circulation presents often during the first days of the disease marks of strong reaction, with evident inflammatory symptoms. The pulse is full, tense, and frequent; the skin is red and transpiring; but in many cases the appearance of the inflammatory symptoms loses in a few days all marks of intensity. Though the pulse retain its frequency, it loses its fulness and tension, and readily yields to pressure. The heat of the skin acquires a degree of pungency which lasts during the whole course of the disease. The cutaneous discharge is in some instances abundant during the first days of the disorder; and if this accompany the first febrile symptoms, it is distinguished for a remarkable acid odour. This discharge, however, disappears towards the middle of the first stage, and is succeeded by that dry burning heat, which is considered as one of the characters of bilious fever.

Some physicians have imagined that they observed that the skin of the belly was of a higher temperature than that of the other parts of the body, and have wished to connect this elevation of temperature of the belly with the circumstance of inflammation in one of the organs contained within that cavity. This observation M. Chomel represents to be incorrect. He has often compared the heat of the belly with that of other regions of the body without recognizing the difference specified in this respect. The cause of the mistake, however, is the difference between the temperature of the belly and that of the upper part of the chest in most persons, in so far as the latter part being much more frequently uncovered than the belly, ought to be cooler; but, admitting the fact as stated, it is impossible to deduce from it any conclusion regarding the nature of the disorder, since it does not appear that inflammation, either of the digestive tube or of the peritoneum, however intense it be, can really cause increase in temperature of the belly, in the same manner as inflammation of the lungs exercises no direct influence on the heat of the skin of the chest.

M. Chomel saw epistaxis often come on, in the first stage especially, and he represents it to be a symptom of great value as a diagnostic character, particularly when it takes place during the first days of the disease. At that time he observes, that, notwithstanding the numerous symptoms peculiar to the typhoid distemper, do not allow, in the majority of persons, any doubt on the true nature of the complaint to be entertained, yet in some cases the absence of the most important symptoms may prevent the physician from giving a decided opinion; and if in these doubtful cases, there ensue one or two attacks of epistaxis, M. Chomel regards the symptoms as often sufficient to decide the true nature of the disorder. The nasal hemorrhage which ensues during the course of typhus, he considers as a phenomenon so much more important, as it is observed even in persons who have never before presented nasal hemorrhages, and as at an age at which the typhoid disorder ensues, it is more rare in the state of health. The rarity of this hemorrhage, he adds, either accidentally, or in the course of other acute disorders, can by no means be compared to its frequency in typhoid fever.

These hemorrhages are not profuse. They are most usually only a few drops either from the anterior part of the nasal cavities, or from the posterior by the throat, in the form of mucous masses streaked and mixed with blood.

Respiration presents in the course of the disorder modifications which are sufficiently important in a diagnostic point of view to be attentively studied by the physician. In the first days of the disease, and often even at the onset, we find on both sides of the chest, in a great many patients, a sibilant wheeze occupying the whole region, but more intense below and behind than above and anteriorly. The cough seldom bears any proportion to the intensity of the wheeze; and the *sputa*, which are scanty, are generally transparent, ropy, viscid, strongly adherent to the vessel, and present a stellated appearance, which depends on the difficulty with which they are ejected from the mouth, and on a peculiar alteration in the fluids furnished by the follicles and the salivary glands. Rarely is the respiration remarkably constrained; but certain circumstances may induce a degree of dyspnœa. Thus the nasal mucus undergoing the same changes as that of the mouth, is dried with the same facility, and at length clogs up more or less completely the canal of the nasal passages, and impedes the free transit of the air. The same effect is also produced by the blood in nasal hemorrhages, which is coagulated in the nasal passages under the influence of the same circumstances. Meteorismus of the abdomen, when considerable, sometimes induces a degree of dyspnœa, which seems to threaten immediate suffocation.

The last symptom taking place in the course of the first septenary period, though quite at its close, is the typhoid eruption. In 54 cases in which he observed this during the years 1831 and 1832, twice only did it appear in the sixth day of the disease. In all the other patients it appeared only during the second, and sometimes the third stage of the disorder.

Very seldom does death take place during the first period. Among forty-two individuals attacked with typhoid fever who died in the wards of the clinical establishment, one only died at the close of this period.

Second Period.—During this stage the symptoms already recounted undergo considerable changes, and new symptoms appear.

1. During the first half of the period, that is, from the seventh to the ninth day, appears the eruption peculiar to typhoid fever, and which consists in minute rose-red spots disappearing on pressure, from half a line to two lines in diameter, round or circular, without elevation, and scarcely raised above the level of the skin, dispersed over the belly, sometimes on the chest, less frequently on the thighs, the arm and the fore-arms. These little spots are so much more distinct as the skin is white; in persons with brownish skins they are sometimes distinguished with difficulty. Their number it is impracticable to determine, because all of them are not equally apparent; but, as a diagnostic character of the presence of typhus, M. Chomel states that they ought at least to be from fifteen to twenty. When they are so few as two or three, he thinks no importance can be attached to their presence.

The eruption does not appear in all points at once. Often after the appearance for two or three days of some rose-coloured spots upon the belly, though in too small number to constitute an important symptom, these spots are observed all at once, in considerable numbers, upon the chest and belly, sometimes on the thighs, the arm, the back, and even the face, though very rarely.

The duration of the eruption varies. In some instances, after two or three days, the spots are no longer visible; in other instances they continue twelve or fifteen days; but in the latter case they consist probably of several successive eruptions, for each individual red spot is usually visible for three or four days only, and sometimes less; and at the end of this time they disappear entirely, after assuming a more vivid tint.

These spots offer at most at the surface of the skin a slight elevation, but never present a conical form or vesicles at the apex.

They rarely appear before the eighth day from the attack of the disorder. The cases observed in the clinical wards during the years 1830, 1831, and 1832, furnished M. Chomel with the following results. Among 70 cases of typhoid fever, in which the presence or the absence of rose-coloured lenticular spots was carefully established, in 16 cases at no period of the disease could traces of this eruption be found,—a circumstance from which it may be inferred, that in about one-fourth of the persons attacked with the typhoid disorder, this eruption is wanting.

In the day on which the eruption appears, the greatest varia-

tion prevails. Among 25 patients received into the wards before the appearance of the eruption, and in whom it took place in the course of the disease,

It appeared between the	6th and the 8th day	in 2 cases.
	18th and the 15th	in 13
	15th and the 20th	in 7
	20th and the 30th	in 4
on the 37th		in 1
		25[*]

But the eruption was confined not to these 25 alone. In 29 others, in whom it was already established at the time of admission, it has taken place at the different periods from the commencement of the disease. It was observed on the day of admission in

1	admitted on the 6th day.	
15	between the	8th and the 15th day.
8	. .	15th and the 20th
4	. . .	20th and the 30th
1	on the 36th.	

Among 54 cases, therefore, in whom these lenticular spots were observed, none presented the eruption before the sixth day, and in two it appeared after the thirty-sixth day of the disorder. The conclusions deducible from these two tables regarding the appearance of this eruption in typhoid fever, M. Chomel regards as certain, since they are found to agree with those made on a much more considerable number of patients by M. Louis, who did not observe this eruption previous to the sixth day, and found it in a single case on the thirty-fifth day.

By connecting with these results another important fact, namely, that this eruption is as rare in other acute disorders as it is common in typhoid fever, and that in the few cases in which it is observed in the course of an attack of *pneumonia*, *enteritis*, or any other acute disease, it is never so abundant as it is in typhoid fever, M. Chomel is disposed to attach to this eruption great value, as a diagnostic symptom in typhus. The objection attempted to be derived from the wish to refer it to the action of poultices, fomentations, or baths, is trivial, and deserves no attention.

This eruption of rose-coloured lenticular spots, M. Chomel distinguishes from petechial spots and flea-bites, by this circumstance, that in the latter, blood is extravasated at the surface of the corion, and that their colouring, instead of being diminished by pressure, becomes more conspicuous by the discoloration of the surrounding skin. In the typhoid spots, on the contrary, the redness disappears at once, as in erysipelas, where there is evidently congestion of blood, and where on the cessation of the pressure it immediately returns.

---

[*] Here is a numerical error which we cannot explain, and which we cannot attempt to correct. The amount of these individual numbers is not 25 but 27; and as from the context the author or reporter repeatedly specifies the former number, we can merely offer the conjecture that the error is in some of the individual numbers.—EDITOR.

M. Chomel allows that this eruption is quite similar to that described by Hildenbrand—as observed in the *Typhus castrensis*, and as M. Chomel had ascertained in numerous cases observed in the year 1814. In consequence of an arrangement made at this period by the administration of the hospitals in Paris, it was wished to collect all the cases of typhus in two hospitals; that of La Pitié being devoted to the reception of men, and that of La Charité to the admission of females. M. Chomel, who was at this period attached to the service of the latter hospital, had numerous opportunities of observing this eruption either in the women admitted into La Charité, to the number of 120, or in a great many men, who, after being admitted thither, were removed to La Pitié. Almost all the patients presented the eruption here specified; and in all it possessed the same characters, with this difference, that it was generally more abundant, and appeared on the face and extremities, parts of the person ill in typhoid fever it seldom is observed.

In some epidemics of continued fever this eruption appears to have been so numerous, that it formed the most prominent character of the disease, and led observers thence to denominate them by the name of Petechial Fevers.

Another form of eruption, which must be distinguished from that now mentioned, but which also occurs in typhoid fever, is that of the *Sudamina*, or sweat spots of Sennert. This consists of minute hemispherical transparent vesicles, from one-fourth to half a line in diameter, with a brilliant surface when viewed obliquely, but imperceptible if sought in a direction perpendicular to their own axis. This is the reason why they have escaped notice, and still escape the notice of those physicians who have studied at a period when this examination was altogether neglected in the course of clinical instruction. They are, however, easily cognizable by touch. They contain a transparent serous fluid, which escapes on their rupture or laceration. Their most usual positions are the sides of the neck, the vicinity of the arm-pits and groins; and with many persons to these they are entirely confined; but in others they extend over the trunk, and in some persons to the whole of the extremities. M. Chomel never observed them on the face.

This eruption, which appears at a later period than the rose-coloured specks, only towards the close of the second period, M. Chomel also regards as of some importance as a diagnostic character of the presence of typhoid fever. But as it usually takes place at a stage when doubt can no longer be entertained, it is rarely requisite to trust to it in this respect, and consequently its importance is inferior.

The readiness with which ulcerations and sloughs are formed at the surface of different regions, and especially at the surface of artificial wounds in the course of the second or in the third stage, M. Chomel further regards as a character peculiar to typhoid fever. Thus, surfaces which have been blistered present often at a certain stage, a covering of a whitish-gray colour, which increases in thickness, and which on its separation leaves an ulcerated surface more or less deep and extensive. He remarks, that though this bears some resemblance to hospital gangrene, it differs in this respect, that while hospital gangrene attacks denuded surfaces only, and takes place in circumstances unconnected with the state of the patients, the sloughing and ulcerative disposition in typhoid fever is observed in all severe cases in all seasons, and in patients in the town generally as well as in those in hospitals, even where the wards are not unusually crowded. Nor is it confined to denuded surfaces, but it appears on many points where the skin is entire. When it attacks any part it is speedily circumscribed, and does not spread as hospital gangrene does. Lastly, it appears not only externally, but also in several internal organs, as is shown by inspection after death.

Mortification of external parts takes place either spontaneously, or in consequence of the influence of rubefacients, especially sinapisms, or in consequence of pressure, or in consequence of the combined action of the two causes last mentioned.

The internal organs, which by their position may be subjected to inspection during life, may be affected with ulcerations, in the mouth for instance, the tongue in which elongated deep narrow ulcers are observed in the longitudinal or transverse direction. The tongue, however, presents often when coated, transverse or longitudinal chops, which, though attended with a sore and painful state of the member, must not be confounded with the ulcers already mentioned. These chops are confined entirely to the viscid dry fur with which the lingual surface is coated, and the moment this disappears the ulcer-like chops are no longer cognizable.

Besides the appearance of the new symptoms now specified, the original symptoms of the first stage undergo a manifest aggravation. The feebleness and slight stupor, or rather listlessness and apathy of the first stage, give place to almost total loss of voluntary motion, and stupor or inconsciousness either of his own condition, or sensibility to external impressions. The patient lies like a log or inert mass on his back, and, though the position be changed, he uniformly relapses into it, however painful it may seem to be, by the ulceration of the back and the contact of the discharges.

The same feebleness extends to the muscles of deglutition and to the different sphincters. In some instances, however, the inability to swallow depends on thickening, induration, and redness of the epiglottis; and in these cases the fluids are rejected by the nostrils with all the marks of impending suffocation. In others it may be traced to inflammation of the *fauces* or ulcerations on the mucous membrane of the pharynx and œsophagus; and in others, he adds, to the presence of a layer of dried mucus at the surface of the base of the tongue and of the pharynx, and which prevents or impedes the motions of deglutition. It is remarkable that M. Chomel does not see in the presence of this dried mucus a very diseased state of the pharyngeal and œsophageal mucous membrane, which not only secretes little or no mucus properly so called, but in which what is secreted adheres to the diseased membranous surface with preternatural and unhealthy tenacity.

Under the same head he enumerates other well known symptoms of this state, viz. retention of urine in the bladder, from loss of its contractile power and insensibility to the stimulus of its contents; *subsultus tendinum*, floccitation or picking of the bedclothes, (*carphologia*,) general and permanent rigidity of the members, deafness, *aphonia*, drowsy or lethargic stupor, (*coma somnolentum*,) with or without delirium, or even profound côma, which almost uniformly terminates in death. At the same time he remarks, that the pulse, though usually small, weak, tremulous, or throbbing and intermittent, and varying in frequency from 80 or 90 beats to 100 or 120 in the minute, sometimes sinks below its natural frequency, and does not exceed 40 or 50 beats in the minute.

The observation that the thirst is generally less intense in the second than in the first period, should have been associated with another observation, that it is less felt by the patient in consequence of the general inertia and torpor of all his sensations, and especially the percipient power of the brain.

The dryness of the mouth he explains by observing, that, as the nasal passages are in most cases impermeable to air, the patient is obliged to breathe by the mouth, the surface of which being thus incessantly traversed by currents of air, is thereby desiccated, while there is not a sufficient supply of fluid secreted by the oral mucous membrane. He gives a good description of the progressive changes in the morbid mucous coating with which the lips, teeth, and tongue, are covered in this stage of the disorder.

As some persons have ascribed the presence and degree of this dark-coloured or fuliginous coating to that species of treatment which has been denominated the tonic, M. Chomel thinks it proper to remark that this coating was observed in cases in which the tonic treatment was not employed. Among thirty-six cases, the histories of which were recorded in the clinical wards, and in which their fuliginous deposits were very well marked, a small number only were treated by means of tonic remedies ; and in none of the latter did this covering not exist previous to the time at which the tonic method was put in use.

It cannot, we believe, be denied, that the action of typhous fever has a tendency, independent of the method of treatment, to cause this dark-coloured viscid coating to be deposited over the lips, teeth, gums, and tongue ; and that in different degrees it is found to take place in all the cases of the disorder. It may at the same time become most justly a question to be considered and determined by physicians, to what extent both its presence and degree are modified by the method of treatment ; and whether, if a method of treatment calculated to moderate and control the general symptoms of the disease, were promptly adopted at the commencement, the mucous surfaces might not be prevented from proceeding to that disordered state, in which this perverted secretion takes place, or rather in which the usual secretion is suspended, and a new morbid secretion is substituted in its stead. Certain it is, that there are not a few cases of fever commencing with all the symptoms said to characterize the commencement of typhoid fever, in which this dark-coloured coating never appears, or at least does not appear in any durable form ; and there are also not a few cases of fever commencing in the usual manner of typhus, in which the urgency of several of the leading symptoms, as intense headach, delirium, want of sleep, and similar phenomena, have led to the early employment of copious blood-letting, general and local, cathartics, and other measures calculated to abate the violence of general symptoms ;—and in which this dark-coloured coating either never did appear at all, or appeared in a form so trifling and temporary, that it could not be said to occupy the place of a marked symptom of the disorder.

The diarrhœa generally continues during this period. In some instances the stools are less frequent than in the first stage. In others the disease assumes a character of great severity, by the motions being discharged involuntarily or inconsciously, both by the great debility which this symptom indicates and tends to aggravate, and also by the disagreeable consequences which ensue from the prolonged contact of the discharges with the integuments.

In the second period also take place, in a small number of cases, those intestinal hemorrhages, sometimes scanty, but in other cases very profuse, and which occasionally cause the speedy dissolution of the patients. In some patients these hemorrhages are repeated daily for a series of days, and in such cases M. Chomel advises the physician to assure himself of the nature of the discharges during this period,—because he says, when the blood has remained some time within the bowels, it undergoes either a species of digestion or a certain degree of decomposition, which changes its appearance, modifies its colour, and converts it into a black pulpy substance capable of being mistaken.

To this we conceive it should be added, that there is no case of typhoid fever in which the physician should not inform himself, by personal inspection, of the nature and quantity of the intestinal discharges; since it is not only from their appearance that he can judge of the intensity of the fever, the state of the intestinal mucous membrane, and of its circulation, and the effects of such purgatives and eccoprotics as he may order, but from them that he can determine whether the febrile symptoms are yielding, and whether the intestinal mucous membrane and follicles be not either already affected, or about to be affected with inflammation and ulceration.

The only important change in the *meteorismus* observable in this stage, is' that in some cases it increases remarkably, and attains that extreme degree to which authors have applied the name of *tympanites.* It then aggravates much the symptoms, by adding to the difficulty of the respiration.

The abdominal pains, though sufficiently acute during the first period, are scarcely perceptible in the second, unless in persons in which the disease assumes a mild form, and who preserve the complete use of all their senses and of their intellectual faculties.

Respiration is often more constrained, though the local symptoms and the sibilant wheeze be not remarkably increased, and are even abated in intensity. The breath as well as the cutaneous surface exhales a fetid odour, which is observed only in subjects affected with fever. In some cases death ensues during this period, that is between the eighth and sixteenth day. Among forty-two persons cut off at the clinical establishment by this disease, and whose histories were noticed, nine died within the interval now specified, that is to say, during the most acute period of the disease.

Third Period.—Of this the phenomena vary, according as the progress of the disease tends to recovery or the fatal termination. As it has been already noticed that among forty-two fatal cases ten deaths took place during the first two periods, it is now to be remarked, that all the other deaths took place during the third stage of the disease. M. Chomel adds, that, among eighty cases of typhoid fever which terminated favourably, in not one case did recovery begin in the first period; and among those whose symptoms presented any degree of severity, none began to recover before the end of the second period. It is, therefore, almost uniformly during the third stage that the febrile disorder subsides, whether the disease terminates in recovery or in death.

When the termination is to be favourable, the intensity of the severe symptoms abates; the patient begins to answer questions addressed, raises his eyes with an aspect of more consciousness than he had previously shown, and shows greater sensibility to his own internal impressions, taking drink with more relish and desire than for several previous days. In other instances the coma, whether accompanied with sleeplessness, or drowsy, *coma vigil*, or *coma somnolentum*, passes into a quiet, peaceful sleep, from which the patient awakens with recovery of part of his sensibility and intelligence.

The mouth and tongue become moist, the meteorismus diminishes, and the matters discharged at the same time he represents to acquire a yellowish colour, to be more consistent, and to be less fetid. They indeed undergo the change in colour and consistence, but, instead of becoming less fetid, it is often the case that they become more so; and indeed this is one of the first decided symptoms of amendment. The next circumstance observed by M. Chomel is one, which, for its importance, deserves especial attention.

> " In some cases at the time when the first improvement in the symptoms ensues, the alvine discharges consist of firm figured motions, to the great astonishment of the attendants, who have difficulty in understanding how such a change could be effected in so short a time. It is probable that these matters had remained during the whole period of the disease in some of the cells of the colon, and had not prevented the passage of liquid motions. There are discharged sometimes in these cases prodigious quantities of black dry-coloured matters."—P. 42.

Now, upon this description, which we believe to be perfectly correct and faithful, we have three remarks to offer. The first is, that although in cases of fever in this country, the alvine discharges are liquid, dark-coloured, and sometimes consist of granular masses and quantities of unchanged bile,—in short, any thing but proper feculent stools, and at the solution of the disease, as the tongue becomes moist and the pulse full, the alvine discharges become more feculent and invariably more fetid, yet we never observe the circumstance now mentioned, of large quantities of solid consistent feculent matter. This must, therefore, be a peculiarity to typhous fever, as it is observed and treated in France. The second remark we have to make relates to the explanation of this peculiarity. No English practitioner would feel himself justified in the present day, in allowing such a phenomenon as the one now mentioned to take place in any case of typhoid fever, if he thought he could by any means prevent it; and as the general practice is, however physicians differ as to other points of treatment, to employ cathartics or *enemata*, to insure the regular if not the daily evacuation of the intestinal tube during the whole course of the disease, such a result cannot, or must very rarely take place, in cases of fever treated according to the English method. Is it not, therefore, a most natural and reasonable conclusion, that the discharge of solid excrement here noticed by M. Chomel as occurring at the period of solution or crisis, is altogether the effect of a timid and inert method of treatment at the commencement, and more especially of a dread of the use, or distrust in the efficacy, of purgative and eccoprotic remedies, and not a part of the natural course of the disease.

To these we would further append a third remark. M. Chomel represents diarrhœa, even from the commencement of the disorder, to be a very constant symptom. Now we would ask what kind of diarrhœa that must be which continues during the whole course of a disease for fourteen or fifteen days, and then, as the symptoms subside, is concluded by the discharge of large quantities of solid figured excrements, and which, he is constrained to infer, must have remained in the cells of the colon, yet allowed the transit of the liquid matters of the diarrhœa. Is it not reasonable to infer that the liquid matters discharged were secreted from a membrane irritated at once by the febrile disorder, and by the continuance, especially in a morbid state, of large quantities of excrementitial matter, and the retained morbid secretions, and the residual matter of whatever food was within the alimentary canal at the moment of attack? Is it not further reasonable to infer, that had due measures been taken in the commencement, and during the course of the disease, by means of cathartics and *enemata*, to expel these excrementitial matters, and keep the intestinal tube as empty as possible of all materials either of food or excrement, the diarrhœa would not only have been checked, but the symptoms of intestinal irritation would have disappeared sooner, and occupied a less prominent figure in the disease. These conclusions, which we propose in the form of questions, appear to us inevitable, from the fact, that when cathartics are given at the commencement, and during the course of the disease, so as to insure the eccoprotic effect, no diarrhœa appears, and if it do, it speedily subsides. To this subject, however, we may again return in a subsequent part of this article.

Among the other changes which ensue when the disease takes the favourable turn, the author notices the increased facility of respiration, the greater facility of expectoration with diminished viscidity of the *sputa*, the diminished frequency and softness of the pulse, and the occasional humidity of the skin.

Regarding the day or days on which these symptoms of amendment are usually observed to take place, M. Chomel states, that among 68 cases in which the period of the attack of the disease, and the day on which amendment began to be indicated by one or more of the changes now specified were noted, the improvement took place at the following periods:—

In 1 patient on the 8th day after attack.
In 1 patient on the 9th day after attack.
In 4 patients on the 12th day after attack.
In 3 patients between the 12th and the 14th, inclusive.
In 10 patients between the 15th and the 16th, inclusive.
In 15 patients between the 17th and the 20th, inclusive.
In 14 patients between the 21st and the 25th, inclusive.
In 11 patients between the 26th and the 30th, inclusive.
In 8 patients between the 31st and the 40th, inclusive.
In 1 patient on the 45th day.

These results show that the commencement of this third period of typhoid fever is extremely variable, because the changes by which, in the majority of cases, that is, in those terminating in recovery, it is distinguished, may take place at any time between the 8th and the 45th days, inclusive.

If, however, we throw aside the cases in which improvement has appeared before the 15th day, and those in which it has appeared after the 30th, which constitute a small number of exceptions, there remain among 68, 50 cases, that is nearly three-fourths, in which this improvement took place from the 15th to the 30th day.

In cases in which the termination is to be fatal by the progress of the disease, the stupor increases, the alteration in the features is more conspicuous, the mouth continues dry, or if it be moistened, it is by the secretion of a viscid mucous fluid of a grayish glutinous aspect, with sanious streaks and a fetid odour,—sometimes dark or opaque, in other cases of the colour of purulent matter.

The respiration becomes constrained and stertorous, sometimes during the last days of the disease, especially below and behind, with crepitating sound, at first large, then finer, and which terminates, in some subjects, in total absence of respiration. In some cases the sputa, when they can be expectorated, present at this period a little blood.

The pulse continues to become more feeble. The temperature diminishes; the skin becomes drier, or is covered with a cold clammy sweat; emaciation becomes general, and makes rapid advances; the eyes become hollow; and all the features present that characteristic immobility which belongs to the *Facies Hippocratica*. Speech is tremulous and inarticulate; answers to questions are void of meaning, and no sense can be collected from the indistinct murmuring between the teeth; feebleness is extreme; and the patient glides into a state of coma, which speedily passes into death.

Death may also follow tetanic or epileptiform symptoms, which come on during the latter stage, and remarkably accelerate the fatal event. These results he regards as less frequent in the second period.

Another mode of the fatal event, fortunately not very frequent in this country, is described faithfully and clearly by M. Chomel in the following manner.

> "In other patients, amidst the ordinary course of the disease, but usually in the third period, or during convalescence, symptoms the most violent and the least expected ensue in a moment. The patient is attacked suddenly, when the state of intelligence and sensation allows them to be perceived, by acute pains of the belly, with a consciousness of dying, decomposition of the features, and afterwards squeamishness and vomiting, whatever may have been the previous form of the typhoid fever. All the other morbid phenomena vanish as it were before the intensity of the new symptoms, which indicate the presence of a peritoneal attack, at first partial, but which most frequently becomes general. The pulse is small and thready; the abdominal pains persist with extreme intensity; at length the observer witnesses all the symptoms of very violent peritoneal inflammation, suddenly developed during the course of an acute disorder, without the action of any external appreciable cause, and which is the result of perforation of the three intestinal tissues, and the escape of the intestinal contents into the cavity of the peritoneum.
>
> "Perforation of the intestinal walls is the most dreadful accident which can ensue in the course of the typhoid disorder, since it inevitably proves fatal. It had been little studied, till the researches of M. Louis lately made known its severity and the frequency of its occurrence. The numerical results obtained during the last five years in the wards of the clinical establishment differ slightly in respect of frequency from those collected and published by this able observer. M. Louis states, that he had observed intestinal perforation eight times in 55 persons cut off by typhoid fever,—an amount which makes the proportion of these accidents in the total number of individuals dying of typhoid fever, equal to 1 in 7. In the cases collected at the clinical establishment of the Hotel Dieu, which presented forty-two inspections, we found only two cases of perforation of the intestinal tissues, which makes the average only 1 in 21 cases. But if we combine these two results, and establish the proportion on a broader basis, we arrive at a common average of 1 in 10 cases,—which probably makes a closer approximation to the truth."

Of another accident occurring as a complication in the third stage, we have rather more experience. This is Rose of the face, which he represents to be more frequent than intestinal perforation. Among 130 persons labouring under fever four were attacked with rose of the face during the third period, and in all the disease terminated fatally. According to our own experience in this city, the accident is still more frequent, but less fatal.

Lastly, The experience of this disease and its mode of termination, leads him to conclude that neither the doctrine of *crises*, properly so called, that is, evacuations or discharges, accompanied with a complete solution of the disease, nor that of critical days, receives any evident support from the phenomena observed in typhoid fever.

Changes in the Blood during life.—Under this head the following facts are noticed.

Among 30 cases in which the circumstances allowed the evacuation of blood-letting from the veins of persons attacked with typhoid symptoms, and in which correct notes were taken, the following results were obtained.

In six cases the clot was firm and covered with a buffy crust.

In 20 cases it offered no trace of crust, but was firm.

In two cases it presented a slight crust at the surface, and beneath it was diffluent and clotty.

In two cases the blood was completely diffluent and clotty.

All these blood-lettings were performed during the first period of the disease, or at the commencement of the second; none during the third.

In none of the eight cases in which the clot was covered with a crust, did the latter offer either the thickness or the colour which it usually presents in *pneumonia*, *pleuro-pneumonia*, and in most of the acute inflammations.

From these facts he infers, that though the blood drawn from the veins during the course of the typhoid presents an appreciable and special alteration in a small number of cases only, viz. 4 in 30, nevertheless it rarely presents the characters peculiar to it in the acute *phlegmasiæ*, with which the formation of the febrile disorder and the intensity of the symptoms appear to have caused typhoid fever to be confounded.

Regarding the four patients in whom the blood drawn was diffluent and gory, with or without crust, he remarks, 1*st*, that this alteration in the blood is observed also in persons attacked with other diseases besides typhoid fever, and sometimes even in patients whose condition presents no formidable symptom; 2*d*, that this diffluence of the blood was found, agreeably to his observations, only in four among 30 cases; and that consequently it must be concluded, that to that disease under consideration it does not belong, either as a primary lesion of which all the other symptoms could be only the effect, or as a secondary phenomenon.

The firmness of the clot in 26 cases, that is, in more than four-fifths of the whole, is an important fact, which strongly opposes the opinion expressed by several medical authors, that in violent fevers the blood always loses its consistence.

II. MORBID ANATOMY OF TYPHOID FEVER.—We pass now to the subject of the anatomical lesions observed in typhoid fever; and these the author distinguishes into two tribes; 1*st*, all those which are constant or almost constant, *i. e.* those which are found in almost all if not in all cases; and, *2dly*, those which are only accidental, or those which are observed less frequently, and which consequently must be regarded as less intimately connected with the disease.

1. *Uniform or constant Lesions.*—These occupy the follicles of the intestinal tube and the mesenteric glands. These are the only lesions almost met with in all cases. All the others, however frequent, by no means approach, in this point of view, to those of the follicles and mesenteric glands, and must be classed under the head of accidental lesions.

The change in the follicles, whether isolated, (glands of Brunner,) or agminated (the glands of Peyer,) by no means uniformly presents the same aspect. If the form of the fever change during the life of the same patient, according to the periods at which it is considered, and circumstances not always easily appreciated, the lesion in the follicles presents also varieties at the different periods at which death takes place. The author impresses the importance of studying carefully these modifications, with the view of recognizing under these different forms the identity of the lesion, and to avoid the error committed by many pathologists, of considering as distinct alterations what are evidently various forms of the same lesion. He then traces the changes in the follicles as they are presented at different periods of the disease.

§. 1. *Swelling of the intestinal follicles and the mesenteric glands.*—It is difficult to fix the period of the disease at which the change in the intestinal follicles now to be described commences, as he had not occasion to inspect the bodies of persons cut off by typhoid fever previous to the seventh day; and the most recent works contain no authentic fact, in which death took place before that period. Among fifty-five bodies inspected by M. Louis, the person, in whom the disease was most recent, died on the eighth day. M. Bretonneau appears to have performed the inspection of a patient who died on the fifth day: but this fact has not been published, and if the report of one of his pupils be trusted, the lesion recognized at this period of the disease did not remarkably differ from what M. Chomel observed two days later, in the body of a patient dead at the clinical establishment in the middle of the seventh day.

At this period, the intestines are usually found distended by

gases, which increase their translucency, and allow the observer to distinguish in many cases externally, patches more or less broad and more opaque than the rest of the membrane, most frequently disseminated along the large curvature of the convolutions of the ileum. By examining the interior of the intestine by means of an incision made close to the mesentery, there are seen at the points corresponding to the external patches, patches of equal breadth projecting from one to two or even three lines, the margins of which project outwardly and advance several lines, like the *pilei* of mushrooms, over the neighbouring mucous membrane.

The colour of these patches varies like that of the surrounding membrane, but it is always deeper. When the neighbouring mucous membrane is pale, they are of a singular dull white; when the mucous membrane is red, the colour of the patches is of a deeper red. Rarely do they all present the same colour. In the same subject are often seen several intermediate shades, from the dead white now mentioned to the deepest red, and arranged indiscriminately.

In size and shape these patches vary not less than in colour. The largest, which are elliptical, rarely exceed two or three inches in their largest diameter, lying in the longitudinal direction of the bowel, and half an inch or one inch at most in the small diameter. Of others smaller in size the shape is rounder; but these as well as the first appear to be seated in the Peyerian glands. Besides these last, there sometimes seem some of smaller size, but the diameter of which diminishes, and is in some reduced to the appearance of a large prominent pustule, more or less rounded. These are the glands of Brunner or the isolated follicles.

These patches are found in the ileum, and some at the end of the jejunum; but in the majority of cases they occupy the end of the ileum; and when there are only some, they are almost always immediately above the ileo-cæcal valve, the ileal surface of which is sometimes totally covered with them. The largest or the elliptical patches uniformly occupy the surface of the bowel opposite to the mesenteric attachment, and are placed at variable distances from each other. The smallest, which arise from alteration of the isolated follicles, are in several subjects greatly more numerous, and placed indiscriminately on the whole circumference of the bowel; but they rarely ascend above the lower third of the ileum. Those of intermediate size occupy also different points of the circuit of the bowel. All are much more numerous, and are sometimes found exclusively on the lower part of the ileum.

This lesion is sometimes observed also in the large intestines, where they present patches only of the smallest dimensions, because in the normal state agminated glands are never found in the colon. In some cases these isolated follicles of the large intestines are very numerous and very close to each other. In others they are few, and therefore easily numbered. These follicles are generally much larger than those found on the surface of the ileum; but their size diminishes from the *cæcum*, where they are largest, to the *rectum*, where they seldom exceed the size of those of the small intestine. This lesion in the large intestines is found in about one-third of the cases of typhoid fever.

When these patches are examined more closely, they offer when touched a degree of resistance similar to that produced by a solid but elastic substance introduced between the intestinal tunics.

The mucous membrane covering them appeared, in the only case in which it was examined on the seventh day, and in the small number of those in which the patients died at a period very near the beginning of the disease, to have undergone no cognizable alteration; its colour is most frequently that of the neighbouring mucous membrane; its surface is smooth; its consistence nearly natural; and its thickness appeared to M. Chomel rather diminished than increased.

If an incision be made over one of these patches, penetrating through its substance, on the margins of the cut surface there can be distinguished, first the mucous membrane, then beneath, a layer the thickness of which varies from one to two or even three lines, consisting of a yellowish-white matter, homogeneous, solid, friable, and with a smooth, brilliant section. This possesses some analogy with unsoftened tubercular matter, but differs from it in the brilliancy of its aspect, which forms a strong contrast with the dull aspect of the crude tubercular matter. Beneath this layer, which occupies the whole extent of the patch, is generally found the cellular tunic, the muscular layer, and lastly the peritoneum. Whatever be the shape and extent of the patches, this layer always presents nearly the same thickness.

Meanwhile the whitish matter is not presented under the form of a layer in the isolated follicles, but offers there the appearance of a little cone. We rarely distinguish any orifice upon the apex of these isolated follicles which occupy the end of the small intestine, while this aperture is often very easily distinguished in the isolated follicles of the cæcum and colon, when they are equally altered; which takes place only in a small number of cases.

At the same time that there is observed at the interior of the intestine those alterations which occupy evidently the follicles, either agminated or isolated, of the intestinal canal, those of the lymphatic glands situate between the two folds of the mesentery and of the mesocolons, which are near these patches or follicles, are found remarkably changed. These glands, which in the healthy state are scarcely so large as a small lentile, and present a colour nearly proportional to that of the tissues amidst which they are placed, assume at the same time as the follicles, considerable enlargement, and acquire a deeper colour than their natural tint. They speedily acquire the size of a large walnut, or even that of a pigeon's egg. Sometimes at the same time at which they enlarge in size they are remarkably softened, so that in certain cases they may be crushed between the fingers by the aid of the slightest pressure. Their interior substance presents a mixture of red and yellow. In other instances, though very large, they continue very firm, and can be crushed only with much difficulty.

The change in the follicles and lymphatic glands now described follows in development a regular progress, which it is important to study. It perhaps never happens that all the follicles of the intestine are affected at once from the commencement; and it is chiefly in those close to the ileo-cæcal valve that the most constant lesion is observed. On examining, a few days after the onset of the disease, the patches or follicles of the rest of the ileum, they are found so much less altered, the more remote they are from the valve; and even one or two feet above the cæcum, they are often found quite natural, when death has taken place shortly after the commencement of the attack. At a later period from the onset of the disease, viz. from the tenth to the fifteenth day, the patches are usually found figured, and the more remote follicles swelled and more completely altered; and at the same time those nearest this valve have already begun to undergo some of those changes which succeed swelling. In persons cut off at a later period, viz. from the fifteenth to the twenty-fifth day, the follicles of the end of the ileum and a portion of the jejunum are remarkably altered, a circumstance not observed at the beginning. The change in the mesenteric glands follows the same progress as that in the follicles. Those nearest to the ileo-cæcal valve are usually first affected; the others become successively affected, and always from below upwards, in proportion as the change in the follicles continues to advance.

This advancing progress of an alteration, which extends successively from the patches primarily affected to the contiguous ones, is analogous to what is observed in a great number of other disorders. Examples of the same process, he thinks, are observed in Rose, which, proceeding from a single point on the nose for instance, spreads successively to the forehead and the cheeks, the eyes, the scalp, and the skin of the neck; and next in small-pox, measles, and scarlet fever, which begin usually on the face, and thence extend gradually to the trunk and extremities.

The number of patches and isolated follicles varies considerably. In some cases only a single patch is found affected; in others the number of tumefied patches exceeds twenty or thirty. As to the isolated follicles, in many cases no traces of them are found; but these are cases in which death has ensued only some time after the commencement of the disease, for instance after the fifteenth or twentieth day; when it takes place later they are always found at the end of the *ileum*, very numerous, removed from each other only a few lines. Sometimes they extend for one or two feet along the bowel; but rarely more at this period; at other times they are also found very numerous in the large intestines.

§ 2. *Ulceration of the follicles.*—If the patient, instead of dying a few days after the commencement of the disease, dies later, during the course of the second period, the lesion in the follicles is shown under a different form from that now described, and itself offers varieties according to the periods at which the patient dies, and other circumstances difficult to be estimated.

The first modification perceived at the surface of the patches or the tumefied follicles is presented by their investing mucous membrane. This membrane begins, indeed, towards the eighth, ninth, or tenth days, or even later, when the development of the patch docs not ascend to the first days of the disease to lose its smooth aspect; it becomes rough, hollowed, disappears even altogether, and in its place appears an excavation, more or less deep, in the layer of homogeneous yellowish matter beneath it; but as the whole patch docs not disappear at once, there remains sometimes for a space shorter or longer, around the ulceration produced by this loss of substance, a portion of the patch itself, which is sufficient to show the origin of the ulceration at this time, and which constitutes the second period of the alteration in the follicles.

When these ulcerations are rapidly formed in the large patches, or those situate near the ileo-cæcal valve, which he likens to mushrooms, not unfrequently their breadth is greater than their supporting base.

The period of their development cannot be accurately established. The following statements are from the facts observed by the author.

Among nine patients who died in the wards of the clinical establishment during the course of the second period, four presented on inspection only figured patches, or tumefied isolated follicles without ulceration, and five presented ulcerations in different degrees.

The four who did not present ulceration died
2 on the 8th day of the disorder,
1 on the 11th
1 on the 12th

The five in whom ulcerations were found during the second period, died,
1 on the 9th day of the disease,
1 on the 10th
2 on the 12th
1 on the 13th

From these facts it results that it is between the ninth and the twelfth days of the disease the mucous membrane investing the figured patches begins to be affected by ulceration.

With these results he combines those obtained by M. Louis, as noticed in the 33d volume of this Journal, (p. 126,) who quotes only two cases in which he observed figured patches without ulceration. In these cases death took place on the eighth day of the disease. Beyond the eighth day M. Louis appears to have uniformly met with ulcerated patches.

M. Chomel is nevertheless obliged to admit, that, in some recent works, there are recorded cases, in which the figured patches were totally unaffected by ulceration in persons cut off so late as the twenty-sixth, the twenty-eighth, or even the thirtieth day of the disease. But he contends, that, allowing that the date of the attack of fever had been reported in these cases with all necessary care, he sees in such cases merely very rare exceptions; because he observed nothing similar either among the facts collected for the space of five years in the clinical wards of the Hotel-Dieu, or in those recorded by M. Louis in his work, and which, combined with those in the present volume, form an imposing assemblage of ninety-two cases of the same disease followed by inspection. He deduces, therefore, the general conclusion, that it is from the eighth day to the twelfth, or at latest to the fifteenth day after the onset of the disease, that the mucous membrane covering the figured patches begins to be ulcerated.

Ulceration of the follicles, agminated or isolated, observes the same progress as their swelling. In the majority of cases the process begins in those situate nearest to the ileo-cæcal valve, and thence extends successively to the others; so that when a patient is destroyed during the formation of these ulcers, we never find all of them of equal size, but we observe a decreasing gradation in their extent from the last situate near the ileo-cæcal valve, to those which are placed high up in the ileum, and which are often not yet attacked by ulceration, while the others are already almost completely destroyed. M. Chomel even thinks it probable, that in several cases, in which the progress of the tumefaction is slow, the patches next the valve are already extensively affected by ulceration, when the most remote do not yet present any traces of ulceration, which nevertheless is to take place subsequently.

Ulceration very frequently attacks the glands of Peyer, less frequently the isolated follicles; and this he regards as the reason why ulcers are less frequently found in the colon, the follicles of which are always isolated, than in the *ileum*. Whether this difference in the frequency of ulceration between the isolated and the agminated follicles, depends on the circumstance, that the isolated follicles showing more seldom the alteration now described under the name of swelling, should be less frequently ulcerated, or on some circumstance peculiar to the agminated follicles, of the nature of a peculiar disposition to undergo ulceration,—are points which he has not been able to determine.

If ulceration in the isolated follicles be rare compared with that of the agminated follicles, it is still less frequent in the isolated follicles only. A case related in the present work (17th case, p. 189,) is the only instance found by M. Chomel among forty-two cases collected in the wards of the clinical establishment, in which the isolated follicles alone were tumefied; and in like manner among those 42 cases he met with a single case in which these same follicles were only ulcerated. (18th case, p. 193.)

The aspect of the intestinal ulcerations presents two very distinct varieties, the examination of which seems capable, he thinks, of throwing some light on an interesting question, viz. the mode in which they are formed.

In a certain number of cases, the ulceration which follows swelling of the agminated follicles begins by the investing mucous membrane, which presents at first in some point a minute ulceration, which extends in breadth and depth, and precedes the destruction of the subjacent layer of whitish matter. In this case it is impossible to deny that the change in the mucous membrane is consecutive to the previous one of the follicles; for it is only upon points where there are tumefied follicles that we find these ulcerations, at least in patients dead from the 8th to the 20th, or even to the 30th day. If ulcers are formed on other points of the mucous membrane, and without lesion of the follicles, it is perhaps only after the period at present under consideration. Among 42 fatal cases, in which inspections were recorded at the clinical establishment, M. Chomel always found in those who died during this period, ulcerations formed upon this situation of homogeneous whitish matter, and which belongs only to points where there exist follicles.

In other cases, ulceration in the patch begins with softening in the layer of yellowish homogeneous matter, which causes the prominent projection of the patch itself. Suppuration ensues as in cases of gangrene, and the mucous membrane, and the layer of whitish matter, form a disorganized mass varying in size. These disorganized masses sometimes, though rarely, occupy the whole breadth of the patch, and are considered as eschars or sloughs. And though these masses present some resemblance to the aspect of parts smitten with gangrene, they nevertheless exhibit also several peculiarities. Their investing mucous membrane often retains its natural state, and in many points has not partaken in the mortification, which appears to have attacked only the layer of whitish matter interposed between the mucous and the cellular tissue. In some instances these relics of this whitish matter, detached on the side of the muscular coat, are supported only by the shred of mucous membrane covering and uniting them to the neighbouring parts.

In this mode of formation of these ulcers, it is impossible not to perceive that the change in the follicles is not the result of that of the mucous membrane, but that, on the contrary, the change in the mucous membrane is the effect of the morbid state of the follicles, and that if in these cases there were gangrene or mortification, it has not been spontaneous, as some pathologists have represented it to be, since it has been preceded by the formation, either in the interior of the follicles, or in the meshes of their surrounding cellular tissue, of a layer of abnormal matter, which may have acted in this case as a foreign body placed amidst living parts, or by a peculiar disposition.

The two forms of ulceration now described, though different in their mode of development, are sometimes observed in the same subject, and produce the same result, viz. the destruction of the layer of swelled or thickened tissue, and of the investing mucous membrane.

The ulceration of the isolated follicles differs little from the two modes now described. Most frequently the mucous membrane investing the summit of the small cone is softened, and the little body of matter contained within it is presented under the aspect of an abscess, which is usually detached entire, with the greatest facility, without leaving, as in ulcerations formed in the agminated follicles, traces of the first alteration.

Each of these forms of ulceration is illustrated by the detail of cases.

Yellow Sloughs.—One of the most remarkable phenomena observed during the second period is the coloration acquired in certain subjects by the figured patches when they are beginning to be ulcerated, a coloration which may be considered almost as foreign to the disease, and which, indeed, is only accidental.

It sometimes happens, though not in the majority of cases, that the disorganized relics of the patches which still adhere either to the bottom of the ulcer or to its margins, or merely to the slip of mucous membrane covering them, present after being well washed, a tint either yellow or green, or of mixed shade, which is manifestly caused by the action of the bile in which they were immersed. This coloration once communicated may be preserved for several days, though the alvine discharges have ceased to contain bile; for in some cases he found that it penetrated the entire thickness of the patches, or of the remains of the patches.

He has no difficulty in concluding, that this coloration is the effect of union with the colouring matter of the bile, and that, consequently, it can only take place in cases in which ulceration is effected by the disorganization of the patches themselves.

Patches with a reticulated surface. Soft Patches of M. Louis.—These patches most usually make no projection at the interior of the bowel; and sometimes even they seem depressed; but in all cases, the membranous net-work which covers them is penetrated by minute apertures very near each other, and is manifestly continuous with the adjoining mucous membrane. This tissue appears to consist of a great number of minute meshes, easily distinguished, with interstices almost equal in size, also very visible, but which become still more so after a few drops of water are poured on their surface. In some subjects the water raising and separating these meshes shows more clearly the separating apertures. In this state he compares this tissue as to colour to the parenchyma of the cherry or the plumb.

In consistence these patches are soft; and sometimes the investing mucous membrane is so softened that it is detached by the slightest friction; and though in other instances it may be less in degree and partial in extent, the membrane is always more or less softened. The colour of the membrane in this state is reddish-brown, and in some cases black.

This change in the membrane is exclusively confined to the parts where there are follicles; and beyond it resumes at once its natural aspect, colour, and firmness.

It is a general character of the mucous membrane thus changed, that its attachment either to the submucous or to the muscular tissue is more or less, in some instances, completely destroyed.

The reticulated appearance is rarely observed in all the Peyerian glands of the same bowel; and it is usually associated with the figured form; sometimes the investing membrane of a figured patch being reticulated, sometimes a figured patch following upon a reticulated one. The reticulated appearance is very frequently seen in the agminated follicles, but much more rarely in the glands of Brunner.

Upon the formation of this reticulated appearance he has been unable to arrive at any satisfactory results.

§ 3. *Intestinal Ulcers.*—When death takes place at a period later still after the attack of the disease, the change in the follicles, isolated or aggregated, presents new modifications, not less important to be known than those already considered. In several subjects not only are there no longer figured or reticulated patches on any part of the bowel, but not even any trace of either of these changes, nor are there on the borders of the ulcers disorganized relics of the patches, which might suffice in all cases to show their origin. However carefully the intestine is examined there are seen only ulcers, the shape and position of which resemble in many cases those of the larger Peyerian glands, but which in many other cases occupy different points, and present forms so varied as to give rise to doubts on their seat and origin.

In form, in number, and in the tissues destroyed, these ulcers vary much.

The most usual shape is the elliptical or the circular. They are seldom so numerous as the figured patches. In some instances they are formed by destruction of the mucous membrane alone, the cellular forming the base of the ulcer; in others the cellular and muscular have been removed; and the peritoneal alone is left. In position they are generally confined to the last twenty or twenty-four inches of the *ileum*, or even only the six last inches. When they take place in the colon, which is rare, they are small, and rarely exceed four or five lines in diameter.

An important question next comes under consideration. In cases of acute disorder, in which such ulcers are formed without offering traces of the white homogeneous layer already described as remains of the slough, are we to ascribe these ulcers to the lesion of the follicles, or are we to regard them as the result of a primary lesion of the mucous membrane, depending either on inflammation or on spontaneous mortification of this membrane?

The question is easily answered in a majority of cases; and in those in which, though the traces of the transition are not visible in the ulcers at the lowest end of the ileum, they are still visible in those higher up. In those cases in which none of the intermediate steps can be recognized, and the ulcers are completely formed, he argues that, when in consequence of an acute disorder, with symptoms of typhoid fever, ulcers are found with the shape, and in the position, of the large elliptical patches, no doubt of their origin can be entertained, though the patches have themselves disappeared; and in these cases, which are the most numerous of those in which death takes place after the 20th day, the identity of the symptoms, the identity of the seat and the shape of the ulcers, are sufficient to establish the nature of the lesion.

As to the cases in which intestinal ulcers are formed in points different from those occupied usually by the large Peyerian glands, and presenting forms totally different, he argues that the fact of the intermediate patches between the isolated follicles and the elliptical patches, is quite sufficient to justify the connection of these with the ulcers now specified. He avails himself also of the evidence afforded by the identity of the symptoms during life; and though he allows that a source of fallacy may be found in cases in which ulcers of this kind are found in the bowels of persons cut off by acute affections different from typhoid fever, yet he maintains that this is hardly possible, and that, considering the variety of forms which typhoid fever assumes in symptoms, and the uniformity of its progress, and the anatomical lesions, he infers that, even in obscure cases, if the other circumstances relating to the character of the disease and its acute form be the same, we ought not to hesitate in ascribing to the same origin the ulcers found in the intestinal mucous membrane.

To another objection which may be urged by some, viz. that ulcers similar to those now described may be found as a sequel of an acute disease of some days duration only, and which might have been preceded by a state of perfect health, he answers, that no case of this nature has fallen within his observation. In all those instances, it is important to remark, in which he found these ulcers, the duration of the disease had been at least eighteen days. From this he infers, until he sees ground in the acquisition of new facts to modify his opinion, that the ulcers found in the intestinal canal after an acute distemper, are the result of lesion of the follicles, and do not depend on any primary lesion of the mucous membrane; and when we find in authors, either ancient or modern, instances of acute diseases, in consequence of which ulcers are found at the end of the *ileum*, we shall be entitled to regard them as cases of typhoid fever.

He next bestows consideration on the question, whether the ulcers produced by the alteration in the follicles may spread eventually beyond the limits of the space originally occupied by these follicles? Though he admits the difficulty of determining this question positively, he thinks that these intestinal ulcers may extend occasionally beyond the limits specified, for the following reason. In all the cases observed by M. Chomel, in which the disease was recent, and in which there remained traces of swelling of the follicles, the patches were distinct, those even which were next the ileo-cæcal valve, though often very large, were isolated; while at a more advanced period of the disease he found the whole circumference of the end of the *ileum* attached by a single large ulcer.

If this opinion, that ulcers of the bowel may, after the separation of the sloughs, still enlarge, be correct, it will add a new proof to those already adduced in support of the inference, that the ulcers, which in form differ from those usually assumed by the follicles, ought not the less to be referred to alteration in the follicles, and that it would be unjust to deny this origin in an ulcer, merely because its shape is different from that usually presented by the agminated or the isolated follicles.

The time occupied by these ulcers in separating all the remains of the patches and eschars cannot be precisely fixed; and he allows that it varies in different individuals, and several other circumstances difficult to be estimated.

All the varieties presented by them he proposes to refer to two general heads;—the first that of simple intestinal ulcers, and the second that of intestinal ulcers, with hypertrophy of the muscular and cellular tissues. In the first the mucous membrane forming the margins of the ulcer is white and extremely thin; seems sometimes to pass insensibly into the base of the ulcer, and cannot be distinguished from it; and presents no indication of local inflammatory process,—neither red colouring, nor softening, nor thickening, nor any appreciable degeneration. The bottom alone presents some very fine fleshy granulations, which project over the smooth mucous membrane of the end of the *ileum*. These ulcers are almost always regularly circular, with the mucous membrane forming their edges detached to the distance of one or two lines from the cellular tissue in their whole circumference, in other instances only partially.

The second form of intestinal ulcers, or that with hypertrophy of the muscular and cellular tissue, are distinguished by their prominent and abruptly cut margins, by their tint more or less slate-coloured, and above all by thickening of the submucous and muscular tissues. When the latter is not destroyed by ulceration, it forms the bottom of the ulcer, where its hypertrophy renders it visible. When, on the other hand, it is destroyed, the bottom of the ulcer is formed by the peritoneal coat, and the muscular coat is found with the cellular and the mucous tissue on the margins of the ulcer, all more or less thickened, sometimes in different degrees and to a great extent,—the cellular, one or two lines, and the muscular, two or three lines. This thickening diminishes progressively as the membrane recedes from the margins of the ulcer, and at the distance of three or four lines the thickness of the intestinal tissues becomes natural.

Intestinal Perforation.—It has been already seen, that, in a pretty large number of cases, the ulcerative process, instead of confining itself to the mucous membrane and the abnormal tissue, of which the figured patches consist, attacks the muscular tissue; and there is left at the base of the ulcer only the thin fold of peritoneum covering the intestine, and which alone prevents the issue of the contents of the alimentary canal into the peritoneal cavity. This membrane itself, however, in several cases, participates in the ulcerative process, and the result is perforation of the intestine, which establishes a free communication between the interior of the intestinal canal and the peritoneal cavity.

In the cases in which this accident ensues, during the course of the typhoid disorder, the patient is occasionally suddenly attacked, without perceptible causes, with excruciating pains, which are forthwith followed by all the symptoms of general acute *peritonitis*, which almost constantly proceeds to the fatal termination. Upon inspection we usually find before opening the intestines, besides the lesions pertaining to acute peritoneal inflammation, perforation of the three intestinal tissues, and sometimes effusion of fecal matter in the vicinity of the aperture. Pressure on the intestine at a small distance from the aperture is followed by the issue of liquid matters mixed with gas. Examined internally this perforation always corresponds to an ulcer, which is larger than the aperture itself, and where it is manifest that the perforation has taken place from within outwards, and not from without inwards. The perforation is sometimes found in a large ulcer; in other cases, but less frequently, it corresponds to a small ulcer. In all cases the size of the aperture itself is inconsiderable. In none of the cases collected by M. Louis, and in which he noted this size, did it exceed three lines; most frequently it was only one line, and one line and a half; and in some instances it was scarcely large enough to admit the head of a pin. Of the two cases collected at the wards of the clinical establishment, in one, that in which it was largest, it did not exceed four or five lines in its largest diameter; in the other it was scarcely three lines.

These perforations are formed almost constantly in the course of the last foot of the *ileum.* Thus in ten cases of this nature, collected and published by M. Louis, the perforation was always found in this portion of the ileum. In one of the two cases collected by the present author at the Hotel-Dieu, the perforation was found more than twelve inches above the ileo-cæcal valve, and in the other it was in the colon at the union of the sigmoid flexure with the rectum.

The aspect and form of the aperture present few varieties. Usually circular, it sometimes presents the slough of the peritoneum, the separation of which has caused the perforation, hanging still to a point of its margins. In other instances the peritoneum is found detached from the muscular tissue, all round the aperture, and for one or two lines from it.

Though a single ulcer is sufficient to produce an attack of *peritonitis* speedily fatal, cases nevertheless occur in which are observed two and even three in the same intestine.

This formidable accident may ensue at various periods of the disease. In one of the two cases observed at the clinical establishment, perforation took place on the fifteenth day of the disease, and in the other on the thirtieth. M. Louis observed it at periods not less different, viz. from the twelfth to the fortieth day.

Examination of the parts surrounding the perforation is highly interesting, since upon the disposition of these parts depends any hope of recovery. Invariably at the abdominal aperture are found traces of acute peritoneal inflammation, viz. the presence of a considerable quantity of purulent matter, or very recent adhesions between the intestinal convolutions. In the vicinity of the perforation especially, the adhesions are most numerous and close, and sometimes so extensive are they that it is requisite to detach successively all the intestinal convolutions before the aperture is discovered. In such circumstances the adherent or applied bowel closes the aperture, and prevents the new escape of the intestinal contents. If the peritoneal inflammation continue limited to part of the abdomen, and the intestinal tube be kept in the most favourable condition, recovery may not be altogether hopeless. But this auspicious result requires the concurrence of so many circumstances, that it has been long regarded as impossible.

In considering the immediate causes of this accident he allows that the *peritoneum*, when exposed by the ulcerative process, may either itself be attacked by that process, or may be destroyed by slough. And he further adds, that the operation of these causes in producing perforation is mightily favoured by the distension of the intestinal tube by gaseous products,—a distension, he justly remarks, which is quite sufficient to produce perforation in an intestine, the resistance of which is diminished by the destruction of the mucous, cellular and muscular tissues, and by the consequent inflammation of the peritoneum. The *inertia* of the bowel, and the accumulation of gaseous matters within its cavity, he therefore regards as circumstances exercising some influence over the production of this fatal accident.

He is further inclined to ascribe to this gaseous distension of the intestines the greater frequency of perforation in cases of typhoid fever, than in cases of consumption, in which intestinal ulcers are so often observed, but in which *meteorismus* is greatly less frequent than in fever. Thus Louis states, that while among 50 persons attacked with typhoid fever, 7 died of intestinal perforation ; among 150 phthisical cases inspected by him, only one case presented intestinal perforation ; and M. Chomel adds, that among 70 phthisical cases terminating fatally during the course of five years in the clinical wards, one only presented this accident. He allows, however, that the slow progress of the disease in consumption, and the thickening acquired by many phthisical cases, by the membranes forming the bottom of the ulcers, may contribute to render these perforations less frequent.

§. 4. *Cicatrization of Intestinal Ulcers.*—The account given of this process does not materially differ from that given by Drs Latham and Roget, found in our 24th volume, (p. 337.) On this we shall therefore not dwell, and merely notice one or two points deserving attention.

In all the patients who have, during the course of several years, died of different diseases from typhoid fever, the author invariably endeavoured to find in the intestinal tube traces of cicatrized ulcer; but he never found any appearance which could be considered as an ancient cicatrix of an intestinal ulcer; and, nevertheless, on several occasions, these inquiries were made on the bodies of patients who stated that they had undergone at an anterior period an attack of severe typhoid fever.

A circumstance not void of interest is, that in all the persons who died of the typhoid disorder in the clinical wards, and who presented intestinal ulcers cicatrized, or in the course of cicatrization, these ulcers were invariably found near the end of the *ileum*, not far from the cæcum. They were never observed in the two upper thirds of the *ileum*, nor especially in the *jejunum*, where, however, were often seen figured patches and ulcers. This difference he does not attempt to explain. He merely argues, that it is difficult to ascribe it to chance only, since among 42 cases which terminated fatally, 11 presented cicatrization beginning or completed. All the ulcers presenting this process occupied the six or eight lowest inches of the *ileum*. He adds as a conjecture, that, as the violence of the disease increases with the number of the ulcers, death ensues in those patients who have ulcers in the whole length of the intestine before the ulcers in the jejunum, and in the first third of the ileum, have begun to be cicatrized.

§ 5. ***Resolution or subsidence of the figured patches.***—This, which is also a process of amendment, is more easily effected than the last. The marks of this consist in the investing membrane forming folds, and thus lying flaccid over the patch.

§ 6. ***Slaty coloration of the patches and of the isolated follicles.***—On this point no precise or new information is communicated. But he warns the reader not to confound it with the usual shaven-beard-like appearance, observed in the Peyerian patches, he allows, in the intestines of many persons.

§ 7. ***Lesions of the Mesenteric Glands.***—On this point we subjoin merely the following tabular list:

	Cases
Mesenteric glands enlarged with incipient softening and suppuration from the 7th to the 25th day,	in 14
M. glands very much softened from the 10th to the 36th day,	12
M. glands filled with a fluid similar to mucus, on the 21st day,	1
M. glands, red, bulky, and hard, beyond the 19th day,	10
M. glands, moderate size, bluish, violet or black, and hard, beyond the 7th day,	3
	42[*]

---

[*] This is also an error in the summation. The amount is 40; but, as the author repeatedly mentions 42, we let it stand.—Editor.

A few other divisions of this part of the subject, for instance the lesions of the follicles in other diseases besides the typhoid disorder, we pass over, in order to give the general summary of the facts in morbid anatomy, with which we must for the present close this article.

§ 8. The first change presented by the follicles is their swelling, produced by the formation beneath the mucous membrane of a yellowish-white, something friable matter, which gives the agminated follicles the aspect of a patch, and the isolated follicles the figure of a large pustule, more or less white, and which several pathologists have erroneously designated under the name of pustule. This form, which appears not to retain its most striking characters beyond the 12th or 15th day after the commencement of the disease, and which is generally designated under the name of *figured patches*, is succeeded in the majority of cases by ulceration, which begins sometimes by the mucous membrane, and spreads gradually to the white matter of the figured patch, and sometimes with the latter softening and detaching it from the connecting parts, and which then involves the destruction of the mucous membrane. These different forms of change in the follicles begin almost invariably with those next the ileo-cæcal valve. In a few cases, however, the reverse takes place.

Towards the same period, that is, from the 8th to the 15th or the 20th day, either at the surface of the figured patches themselves, or, what is most common, on Peyerian glands, which do not present traces of this first change, and only in some subjects, the mucous membrane is found softened, of a colour more or less deep, detached from the subjacent tissues, penetrated with many holes, which are only enlarged orifices of follicles, and which give it the aspect, causing to be applied to the agminated or isolated follicles presenting it, the name of *patches with reticulated surface.*

In proportion as the patches on these disorganized remains disappear by ulceration, or a sort of mortification, the edges of the resulting ulcers are flattened, approach more closely to the bottom, and present conditions very favourable to cicatrization, or acquire, on the other hand, a preternatural thickness, owing to hypertrophy of the submucous and muscular tissues, and assume an appearance offering some analogy with that of scirrhous texture. Ulceration of the patches extends not only in breadth but in depth, and attacks successively the submucous and the muscular tissues, and even in several cases the peritoneum, which is destroyed either by ulceration or mortification, causing perforation of the intestine.

In favourable circumstances, cicatrization may take place by the edges of the ulcers approaching the bottom, or being confounded with it.

Some patches do not proceed to ulceration, but return gradually by a species of detumescence or resolution to the natural state.

In the following table, the lesions occurring in each class of cases of the whole 42 deaths are classified according to their anatomico-pathological similitudes.

Swelling or Tumefaction of the Follicles.

In 1 dead on the 13th day, isolated follicles only swelled.

In 2 dead on the 10th and 11th days, the agminated follicles only swelled.

In 2 dead on the 7th and 9th days, the agminated and the isolated follicles simultaneously swelled.

Ulceration of the Follicles.

In 1 dead on the 18th day, ulceration of the isolated follicles only.

In 6 dead on the 10th, 12th, 15th, 19th, 25th, and 58th days, ulceration of the agminated follicles only.

In 7 dead on the 12th, 16th, 20th, 21st, 26th, 30th, and 34th days, simultaneous ulceration of the agminated and of the isolated follicles.

In 2 dead on the 19th and 27th days, reticulated patches only, the one entire, the other partially ulcerated.

In 1 dead on the 10th day, figured patches and reticulated patches beginning to be ulcerated.

Intestinal Ulcers.

In 3 dead on the 20th, 21st, and 28th days, ulcers with hypertrophy of the cellular and muscular tunics, and the aspect of scirrhous texture.

In 1, dead on the 28th day, figured patches, entire; below, reticulated patches near the ileo-cæcal valve ulcerated without remains of the patches.

In 4, dead on 33d, 35th, 38th, and 42d, days, complete ulcers with flat edges, and seeming disposed to cicatrization.

Ulcers cicatrized or in the course of Cicatrization; figured Patches in the course of resolution.

In 5, dead on the 33d, 34, 36, 50th, and 60th days, ulcers with flat margins, with incipient cicatrization, or perfect cicatrization.

In 2, dead on the 36th and 60th days, patches reticulated and lower down ulcerated with incipient cicatrization.

In 2, dead on the 21st and 22d days, figured patches all entire, and all appearing to return to the natural state.

In 1, dead on the 17th day, figured patches which appear about to return to the natural state; below, ulcers with incipient cicatrization.

In 2, dead on the 30th and 60th days, patches not prominent, coloured deeply blue; and below ulcerated with incipient cicatrization.

In 1, dead on the 45th day, patches all coloured of a deep brown, with creamy softening of their investing mucous membrane.

Such are the principal uniform lesions presented by the intestinal follicles, and the chief varieties they present, in the bodies of persons cut off by the disease under consideration. The uniformity with which they are observed after death by the typhoid disorder, M. Chomel maintains, shows readily the importance which he attaches to the correct description of these lesions, and the various forms under which they occur; and he contends that they constitute one of the principal distinctive characters of the disease, and which excludes all doubt on its nature, whatever be the symptoms during life.

The uncertainty in which the existence and extent of these lesions have been and still are involved, he ascribes altogether to imperfect and negligent examination of the intestinal canal; and he includes under one general sweeping denunciation of vague and inaccurate observation, all the authors who have written on the subject of fever, and who either have not been able to recognize, or deny the existence of these lesions.

> "Many writings published even in our time on continued fevers, and especially in foreign countries, where the progress of pathological anatomy has not advanced so rapidly as in France, still employ the same vagueness of language in designating the lesions of the intestines. The facts contained in them, though important in other respects, are nevertheless incomplete, and serve neither to support nor to oppose the opinion announced at the commencement of these lectures, viz. that, in consequence of the majority of the affections designated generally under the name of Continued Fevers, lesions of the intestinal follicles are found."

From these researches he also infers, that this change is met in almost all cases of Typhoid Fever, since in 42 cases of this disease terminating fatally at the clinical establishment during the course of five years, none occurred in which it was not found in some degree. At a subsequent part of the inquiry he indeed admits that there are some cases in which no trace of these lesions can be detected. This exception, however, like a genuine advocate for general deductions, he throws entirely aside, with the remark, that this is not the place to enter on this discussion. It is sufficient, he says, at present to state the fact, that, among all the subjects attacked with continued fever, who for the space of five years have died in the clinical wards, none has not offered some one of the varieties of change in the follicles now described, while no other lesion adequate to explain the febrile action is found.

His final conclusion is, that his own researches, supported by numerous observations, completely concurring in the most important particulars with those of Louis in France, and Bright in England, prove that the change in the intestinal follicles is a state quite peculiar to the Typhoid Distemper, the different periods of which may be traced as we trace those of an abscess or a cutaneous eruption.

And here for the present we must pause in our account of this volume. We have confined ourselves chiefly to a condensed abstract of the results obtained by M. Chomel, without entering much into the question or questions relating to their general accuracy. To say that we adopt the whole of his views, as fulfilling the notion we form of a correct history of the Morbid Anatomy and Pathology of Continued Fever, would be impossible, when we know how many facts are at variance with several of his deductions. His descriptions may be perfectly correct, as applicable to Continued Fever occurring in France. But in this, and, we may add, other countries, various facts show that they do not admit of general application. These the great length of the present article forbids us to consider. But we propose, before we entirely quit the subject, to inquire to what extent the evidence adduced by M. Louis and Chomel is in accordance with that furnished by the necroscopic researches of observers in other countries.

Meanwhile we cannot take even this temporary leave of the author without recommending the study of his work to the attentive and serious perusal of all those who wish to understand thoroughly the nature and tendencies, shall we add the complications, of Continued or Typhoid Fever, and those circumstances which tend to give it its unfavourable termination.

We shall take an early opportunity of directing the attention of our readers to the subsequent parts of this volume, which contain much instructive information on the history, causes, and treatment of Typhoid Fever.

Art. II.—*Report of the Proceedings under a Brieve of Idiotry, Peter Duncan against David Yoolow, tried at Coupar-Angus, 28–30th January 1837; with an Appendix of relative Documents, and an Introduction.* By Ludovic Colquhoun, Esq. Advocate. 8vo. Edinburgh, 1838, Pp. xliv. 116, 19, and 7.

The volume now before us is one of no ordinary value, inasmuch as it brings before the reader, within a limited compass, a view of the law and practice of the Courts of Scotland, in cases of idiotry, and details a case of considerable interest to the medical jurist. We cannot help, however, observing, that it exhibits another instance of the contradictory nature of medical evidence, of which unhappily the examples have been so numerous as to have lowered its value materially in the estimation of lawyers and juries, and to have had the effect of placing the medical witness rather in the light of a partizan or hired advocate, than in that of a man of science acting in the capacity of an assessor to the court. We do not overlook the circumstance, that the medical witness giving his testimony on oath, must be supposed to state fairly and truly his opinions. But it appears to us that, in not a few instances, a morbid anxiety for notoriety, a feeling of prejudice against the professional witnesses cited by one party, and a desire to break a lance, as it were, with a man of established reputation, have occasionally so far warped the judgment of some medical men, as to have induced them to form an exaggerated estimate of the value of circumstances, in reality of little moment, and to overlook or depreciate that of others of paramount importance. The result necessarily is, that the case assumes a new and a false appearance, judge and jury are confused, and, if an act of positive injustice be not perpetrated, full and substantial justice fails to be awarded.

Nor in such cases are judges and juries always blameless. It but too frequently happens that one medical witness is accounted by them to be as good as another, and, without taking into consideration that the opinion of a man, who has devoted his time and talents to a particular subject, is on that subject of more value than that of ten others, who may not have bestowed a thought on it till, consulted by some one connected with the individuals whose interests are at stake, they are too apt to number rather than weigh the evidence, and to pay the same deference to opinions dictated by a spirit of rivalry, and characterized by ignorance and confidence, as they do to those of men of talents, learning, and experience.

We must protest, too, against the practice of taking as evidence in judicial inquiries into the sanity or insanity of an individual, the opinions of those who are not familiar with the subject. These are generally founded on a very narrow view of the case, and rest on some insulated circumstances which happen to strike the observer forcibly. Now, such facts, when connected with others, may be susceptible of a very different explanation from that given by the witness; but the opinion, with the grounds on which it rests, being stated, without those modifying circumstances, which a more enlightened witness would have observed and duly appreciated, is received with confidence by the judge as well founded, and the evidence of a competent witness may thus be neutralized. A clergyman, for instance, will attest the sanity of an individual who is able to state, in the language of the Confession of Faith, the doctrines of the church, and will give as the ground of his opinion, that the suspected person answered him rationally when questioned respecting the Mosaic and Christian dispensation, and the grounds of his faith. Satisfied with this, which, from his professional train of thinking, he is apt to take as sufficient proof of intelligence, he pays no attention to other circumstances, which afford more satisfactory means of judging of the true state of the case, and attributes any absurdity of conduct to mere eccentricity.

But this subject is too important to be discussed in a casual manner. We shall therefore postpone its consideration till an opportunity be afforded us of bringing it fully before our readers, and in the meantime proceed with our examination of the work, the title of which is prefixed to this paper.

The volume consists of four parts, the first being devoted to an exposition of the principles and practice of the law of Scotland in cases of idiotry; the second to a detailed statement of the evidence, a report of the speeches of counsel, the charge of the judge, and the verdict of the jury; the third to papers connected with the case; and the fourth to extracts of the records of the kirk-session of Kettins respecting the family of Yoolow. Our attention shall be directed to the first two only.

In the first pages Mr Colquhoun, after pointing out succinctly and perspicuously the principles on which legal protection is, in all civilized countries, afforded to the property and persons of individuals of unsound mind, proceeds to state the leading provisions of the law of Scotland in such cases.

These "are based on a recognition of the obvious and important distinction which subsists between those instances where, from an absolute defect of capacity, the person as well as the property of the individual requires protection, and those instances where, from the deficiency being only partial, personal protection is not called for, and the application of a less stringent remedy will suffice to secure the property of the individual against the craft of others, or his own mischievous exercise of the ordinary powers of administration. This distinction has naturally suggested the division of such persons into two great classes.

"The first of these classes, as described by our institutional writers, comprehends every one who is in legal language fatuous and naturally an idiot;—or furious, mad, and a lunatic;—or whose external senses are so imperfectly organized as to render him totally incapable of the independent management of himself or his affairs.

"The second class comprises those who, although not so devoid of reason as to be absolutely incapable of acting for themselves in the minor affairs of life, are, nevertheless, from imbecility or weakness of judgment, considered by the law fit subjects for a limited degree of restraint, in matters of peculiar importance."—Pp. viii. ix.

The remedy afforded by the law in cases of the second class is that of interdiction, which is thus explained by Erskine. "A legal restraint laid upon those who, either through their profuseness or the extreme facility of their tempers, are too easily induced to make hurtful conveyances, by which they are disabled from signing any deed to their prejudice, without the consent of curators, who are called interdictors." This may be granted by the supreme court on an application of the heir or next of kin of the party, supported by satisfactory evidence, or even without this, when in any suit before it, a party appears to be liable to imposition from extreme profuseness and facility of temper. A man also who is conscious of the necessity of some restraint, but averse to the more public disclosure of his weakness, which the judicial form of proceeding implies, may interdict himself by executing a bond, obliging himself to do no deed which may affect his estate, without the consent of certain friends whom he selects for the purpose.

The effect of interdiction, in whatever way it may have been interposed, is, that after the observance of certain forms, all subsequent deeds, done without the consent of his interdictors, and affecting his real estate, may be reduced, unless it can be shown that they are of an onerous and rational character, and not prejudicial to him.

The supreme court, too, may appoint guardians of the property of individuals under peculiar circumstances involving incapacity, as in the case of a lunatic or idiot, till the party entitled to do so shall have obtained the remedy of cognition, or where, from age and infirmity, the party is altogether incapable of managing his own affairs.

In the case of individuals again, comprehended under the first class,—those who in legal language are denominated fatuous and naturally idiots, or furious, mad, and lunatics, a permanent and unlimited curatory becomes necessary, and the form by which the question is investigated and determined is the process of cognition and inquest. The class of individuals to whom this process is applicable is thus more fully described by Mr Colquhoun.

"Those persons are held by the law to be in this situation who either, *first*, from a total defect of judgment: or, *secondly*, from a disordered brain; or, *thirdly*, from the wrong texture or disposition of the organs of sensation, are naturally and irremediably incapable of managing their affairs. 'Of the *first* class are fatuous persons called also idiots in our law, who are entirely deprived of the faculty of reason, and have an uniform stupidity and inattention in their manner, and childishness in their speech, which distinguishes them from other men; and this distemper of mind is commonly from the birth and incurable.' Although the term *idiot*, in its legal sense, seems more properly applicable to such persons only as have been without understanding from their nativity, and whom the law therefore presumes never likely to attain any, it includes also those who may have been at one time in possession of sound intellect, but who through any cause have been subsequently deprived of it, and are reduced to a state similar in its manifestations to that of congenital idiocy.

" In the *second* class are ranked furious persons,—and they, strictly speaking, ' cannot be supposed to be deprived of judgment, for they are frequently known to reason with acuteness ; but an excess of spirits and an overheated imagination, obstruct the application of their reason to the ordinary purposes of life ; and their infirmity is generally brought on by sickness, disappointment or other external accidents, and frequently interrupted by lucid intervals. Under these may be included madmen ; though their madness should not discover itself by acts of fury, but by a certain wildness of behaviour flowing from a disturbed fancy.' The term lunatic is, in our legal language, used in reference to those individuals whose cases are characterized by the alteration of lucid intervals with ebullitions of frenzy.

" To these two classes, our law writers add a *third*, which has reference to persons whose organs of sensation are defective. * * It will not be attempted, however, at the present day, to impose a permanent curator on a person who should be destitute merely of speech and hearing, unless the existence of other circumstances, from which incapacity is inferrible, should be established by satisfactory evidence. But if, to the deprivation of these senses* be added that of the sense of sight, it is evident that an individual thus imperfectly constituted must be incapable of receiving, through the medium of the senses which remain to him, however perfect, any impressions which may enable him to advance even a single step in the scale of intelligent being.† Such a person, therefore, is properly placed by the law in the same class with the idiot,—his state declared by the same form of procedure,—and the restraint imposed upon him equally comprehensive."—Pp. xi. xii. xiii.

As the process of cognition and inquest is one with which our readers may not be acquainted, and as no account of it is given in any work of medical jurisprudence, as far as we recollect, the following view of its nature and condition, given by Mr Colquhoun, may not be uninteresting.

" Cognition proceeds on a Brieve, which is a writ issuing from the Chancery, addressed to the Sheriff or other Judge-ordinary of the territory within which the person who is alleged to be furious or fatuous resides. By this writ the judge is directed to summon an inquest for inquiring, *first*, into the person's true state, and, if the inquest shall hold the existence of fatuity or furiosity to be proved, the time when such fatuity or furiosity began; and, *secondly*, who is the next male agnate of lawful age on whom the office of curatory may be conferred. Where the party is alleged to be fatuous, the writ which the Chancery issues is a Brieve of Idiotry; where he is alleged to be furious, a Brieve of furiosity. There is no difference in point of style between these brieves, except in the clause expressing the different conditions of the persons whose state they are meant respectively to ascertain. In the Brieve of Idiotry, the words are,—'*Si sit incompos mentis, fatuus, et naturaliter idiota, sic quod timetur de alienatione tam terrarum suarum, quam aliarum rerum mobilium et immobilium; et quamdiu sustinuit istam fatuitatem.*' In the Brieve of Furiosity, the issue is,—'*Si sit incompos mentis, prodigus et furiosus, viz. quod neque tempus neque modum impensarum habet, sed bona et possessiones dilacerandas et dissipandas profundit; et quamdiu sustinuit istam furiositatem.*' From the act of James III. * * it appears, that at that time and previously, it was the practice to use only one brieve, which was applicable both to furiosity and idiocy. The essential difference between these states of mind, however, suggested the expediency of separate brieves, each applicable exclusively to the particular state which is supposed to be that of the party. And although the court has held that brieves of both kinds may be taken out against the same person at the same time, as, indeed, seems at one time to have been the practice, still,—unless in circumstances which render it a matter of doubt, whether the party sought to be cognosced should be proceeded against, on the allegation that his state is that of furiosity, or is that of idiocy, and consequently, what brieve is the appropriate one,—the advantages which result from thus confining the inquiry to that state, which is believed and alleged to be the actual state of the party, are too obvious to admit of a probability that the simpler form of procedure by a single brieve corresponding to the case, will be frequently departed from in practice.

---

* Mr Colquhoun surely does not mean to call speech a sense.

† Mr Colquhoun goes rather far, when he asserts that an individual possessed merely of the senses of touch, taste, and smell, and the power of locomotion, is incapable of advancing even a *single step* in the scale of intelligent being. He will on reflection see that some progress may be made, though we grant very little.

"The brieve is issued by Chancery, generally on the application of the nearest agnate of the party. If the agnate should decline to interfere, or where no agnate exists, it seems to be settled that the nearest relations on the mother's as well as the father's side may competently prosecute the brieve. Where the relations refuse to act, or a party has none, it would appear that there is in our law no form by which he can be subjected to cognition. * * * The person whose state is to be tried under the brieve must be made a party to it, because if he be truly of sound mind, he has good interest to oppose it, and instances have occurred of brieves having been advocated on the party's opposition."—Pp. xv.—xix.

The first question which the jury have to decide, is the state of the party at the time of the trial; and one of the means by which this must be ascertained, is his being produced and examined by them, the judge and others professionally engaged in the proceedings. Should this be omitted, if the individual be found of unsound mind, the verdict may be set aside; but if a verdict of soundness of mind be returned, though "clearly open to reduction at the instance of any one qualifying an interest, it is equally clear that any proceeding with this view, at the instance of the pursuer of the brieve, should, and in all probability would, be repelled as incompetent," because it was his own fault that the jury had not an opportunity of seeing and examining the individual.

But though the examination of the suspected party in court is an essential part of the proof, and, indeed, may in general be looked upon as sufficient proof, yet cases occur in which it may furnish no evidence sufficient to satisfy the jury regarding the true state of his mind. This no doubt suggested the having recourse to the testimony of individuals supposed capable of affording the necessary additional information, and thus a means of proof, not originally contemplated by the law as requisite in any case, was at first received in some, and in course of time in all.

The evidence thus introduced consists of the testimony, 1*st*, of medical men, especially of those who have made unsound mind the special object of their study; and 2*d*, of those who have had opportunities of observing the party, and have had intercourse with him. Mr Colquhoun's remarks on the value of these two classes of witnesses are so judicious that we shall transcribe them here.

"It is not intended here to discuss the *questio vexata*, whether the evidence of medical men should not be considered inferior to that of other individuals who may have had frequent opportunities of observing the party, where the same opportunities have not been enjoyed by the practitioner. It must be admitted that the 'patient inquiry, daily communication with deranged persons, and attentive observation of their habits,' which the exercise of their professional duties implies, must render men thus practically conversant with the affections which are held to constitute unsoundness of mind, more competent observers, in the general case, than mere unprofessional persons; and that in a certain class of cases, even with more limited opportunities of observing, their observations must be more to the point, and their testimony, consequently, more important than that of unprofessional individuals whose opportunities may have been infinitely greater.

"Without entering into particulars, we may observe, that the cases in which a resort to medical evidence seems proper and likely to be beneficial, are those chiefly where the question to be decided is of *insanity*, (contradistinguished as well from idiocy as from soundness of mind,) or when it refers to the state of a party alleged to be *non compos* from imperfect construction of the organs of sensation. But where the question is of *idiocy*, although it is possible to conceive a case which might receive some illustration from medical evidence, still, when we look to the nature of that state as described both by our institutional writers, and the most eminent medical authorities, it is difficult to imagine why an intelligent jury should not, from their own examination of the party, be as competent, in the general case, to determine whether the party is or is not in that state, as they could possibly be after hearing the testimony of all the practitioners in the empire.

"By our more modern practice, however, medical evidence is invariably resorted to, whatever the nature of the case may be; and the consequences may easily be divined. In many cases its operation is most salutary; in some, although productive of loss of time, and probably of patience, it is harmless; while in others, its effect is positively mischievous, and, instead of throwing light on the point to be ascertained, it envelops a clear case in doubt, and plunges a doubtful one into still deeper obscurity. But, notwithstanding the inconveniences, and even worse than inconveniences, that sometimes result from the indiscriminate application of medical evidence to the investigation of such cases, the advantages which are often to be derived from the testimony of learned and enlightened members of the medical profession are so obvious, and the satisfaction which it must frequently afford to a jury to find their own inferences corroborated by those of individuals generally so competent both to observe and to infer correctly, is so desirable, that these considerations should incline us, on the whole, more towards the admission than the exclusion of medical evidence, and should induce us rather to acknowledge with gratitude its frequent advantages, than to carp and cavil at its occasional defects.

"The evidence of the medical witness relates partly to matter of fact and partly to matter of opinion. He states to the jury such facts relevant to the question at issue, as have fallen under his notice, or been elicited by the tests to which he has subjected the party. He states also, the opinion which he deduces from these facts, and the reasons of that opinion. From what has been said in the preceding pages on the subject of evidence, it is obvious that the essential point for the consideration of the jury is, not the opinion which the witness shall have formed, but the facts on which he has formed, it. But, although the verdict of the jury must ultimately be founded on their own inference from the facts proved in the case, the opinion of an intelligent and experienced medical witness is unquestionably well worthy their serious attention as an aid to the formation of that inference; and therefore, in considering the facts which he attests, the jury ought to consider, too, the conclusion which he draws from these facts, and the reasons he assigns for having come to that conclusion. Should these reasons appear not to warrant his conclusion, while the jury reject the conclusion, they still have the facts from which a more legitimate inference may be deduced by themselves. It is almost unnecessary to remark, that, however eminent in his profession the witness may be, the jury should in no case adopt his conclusion, unless the grounds of it are completely satisfactory to their own minds. Where this is not the case, or where medical witnesses come to different conclusions on facts essentially the same, the jury must throw aside the opinions which they deem inconclusive, and form their own on the facts which shall have been established in evidence, with such assistance as they may receive from those opinions, should there be any such, which they consider well founded.

The effect to be given to the evidence of individuals not belonging to the medical profession, must be with reference exclusively to matters of fact; and, even under this limitation such evidence seems entitled generally to but little weight. For so seldom it is that unprofessional persons are even tolerably familiar with the genuine *indiciæ* of unsoundness of mind, and so loose and inaccurate are the notions commonly entertained on the subject, that we cannot rationally expect to find in non-medical witnesses, either very competent observers, or very distinct reporters. What they have seen they have in all probability seen accidentally, and investigated superficially; and, in the general case, even under the most favourable circumstances, the facts to which they can speak must, as tests of capacity, be beyond all comparison inferior in point of weight and relevancy to those elicited by the well-directed examination of the party by the jury themselves. Where the jury, therefore, have an opportunity of examining the party, the testimony of ordinary individuals, although occasionally not without its use, may in most cases be looked upon as unimportant; and the jury in founding any conclusion on such evidence must proceed with that circumspection which the questionable and slippery character of the premises demands."—Pp. xxxiv.—xxxvii.

The jury then, having by an examination of the party, and by the testimony of medical and other witnesses, ascertained the state of his mind, the next question is, if he be found of unsound mind, how long he has been in that condition; and the last, who is the nearest agnate of lawful age, that is, the nearest male relation by the father's side of the age of 25.

The party having been examined, and the evidence of the witnesses taken, the jury are addressed by the counsel on both sides, and the evidence summed up by the presiding judge, who gives the necessary directions in point of law. The verdict may then be either returned immediately, or the jury withdraw to consider the matter. When their minds are made up they come into court and deliver their verdict. "The verdict of the jury, which consists of fifteen, does not require unanimity, but may be determined by a simple majority."

"If the verdict which they ultimately return shall find that the party is of unsound mind—that he has been in that state for some time back,—and that the claimant, or, as it may happen, some other relation, is his nearest agnate of lawful age, that individual proceeds to grant a bond of caution finding security for his intromissions with the estate of the party. The clerk of court gives out an extract of the service, which, with the verdict attested by the judge and chancellor of the jury, is returned, or, as it is technically called, retoured to Chancery ; and an extract of the retour properly authenticated, being obtained from the Chancery office, letters of curatory in favour of the agnate are expede under the quarter seal, and form his title to act. Where again the verdict finds that the party is not of unsound mind, a corresponding retour is made, with similar formalities so far as applicable.

" The effect of cognition is that the party cognosced ceases to have any person in law. He is held to have been incapable of acting or of consenting to any act, since the time at which his mental infirmity is declared to have commenced ; and any act or deed which he may have done subsequently to that time, and before cognition, or which he may do after cognition, is *ipso jure* null, and may be found so by way of exception, without the necessity of an action of reduction. The powers of curators to persons of unsound mind, and the obligations which their offices bring them under, are precisely the same as those of tutors to infants or pupils." p. xli.

" The office expires, by the death of the party under curatory, or by his return to a sound state of mind. A curator, however, cannot resign his office on the occurrence merely of one of those lucid intervals commonly attending that kind of insanity which is termed *lunacy*, for before he can competently do so in this, or in any other case where recovery is alleged, ' the distemper must be radically cured, and that ought regularly to be declared by the sentence of a judge.' The form by which the curatory is brought to a termination in the event of the party recovering his reason, is by a *declarator of reconvalescence*—a description of action to which the supreme court alone is competent. In this action, on satisfactory proof of convalescence, the court will pronounce a judgment declaring the curatory expired, void and null, and the party *sui juris* in time coming. But should a relapse occur, the curatory cannot be revived, and the curator, should he desire to reassume the office, can only do so after a new cognition by brieve and inquest."—P. xlii.

Having thus given a brief view of the form of proceeding in cases like the one which we are about to notice, we shall now present our readers with an outline of the case.

David Yoolow, whose idiocy was sought to be proved, was at the time of the trial about 53 years of age. At an early period of life, at the age of 10, he had an attack of paralysis, which reduced him to a state of great physical debility, and seems undoubtedly to have affected his mental powers, insomuch that his parents, by the advice of the medical attendants, put a stop to his education. Previously to his illness he had acquired only a little reading, but no arithmetic. After the death of his parents he remained under the care of his sister, leading the life of a recluse, till her death in August 1836, after which, till the time of the trial, January 1837, he continued in the same house, and the business of the farm was conducted by servants, over whom he exercised no control, but who, on the contrary, had great influence over him. Whether this was exercised for good or evil does not exactly appear. The brieve was procured on the 19th October 1836, and after some legal discussion, came on for trial on the 28th and 30th January 1837. In consequence of the defender's state of health the Sheriff held a court at Coupar-Angus, instead of Forfar, the capital of the county.

A jury having been chosen by ballot and sworn, proof was given of the due execution of the brieve, which, with the claim, was read. The counsel for the pursuer then stated his case, and moved for the production of David Yoolow in Court. This was objected to by his counsel, on the ground that it would be hazardous to his health, or might even peril his life. He therefore moved that the jury should visit the defender at his own house. The counsel for the pursuer offered to prove that the defender was in such a state of health as to admit of his being removed to the place of trial, and produced a certificate to that effect under the hands of four medical men, which he offered to verify if required. Upon this the Sheriff allowed both parties to prove their allegations.

The counsel for the defence then examined Dr P. Nimmo, Physician to the Lunatic Asylum, Dundee, and Mr Alexander Bell, Surgeon, Dundee, both of whom declared on oath that it would be dangerous to produce the defender in Court; after which the counsel for the pursuer stated, that though prepared to adduce contrary evidence, he would not avail himself of it, but would consent that Yoolow should be visited at his own house.

Thus, at the very commencement, the medical witnesses differed from each other in opinion on a fact, which was connected with their everyday avocations. We have no means of ascertaining who the four medical men were who certified that Yoolow might with safety be produced in Court, neither do we know the terms of their certificate. We must, however, state, that we do not consider the evidence of Dr Nimmo satisfactory, as his opinion of the possibility of an apoplectic attack was grounded upon the defender's nervous and excitable state, on his coming suddenly into Court after his long seclusion. Now this effect could have been produced only through the medium of Yoolow's mind, and yet the witness in his evidence afterwards tells us

that the defender was a man of a strong mind, and that the paralysis with which he was affected in his boyhood had had no effect on it. His words are, " I think his mind as entire as if he had had no paralysis, and as if his body were in vigorous health and strength, and had no deformity." We do not see how these opinions can be very well reconciled.

After the defender's counsel had opened his case, the Sheriff, with the clerk, jury, and leading counsel on each side, then proceeded to the residence of David Yoolow, which is distant about three miles from Coupar-Angus.

"On their arrival there, the sheriff and counsel went into the apartment where David Yoolow was. The sheriff stated to Yoolow, that he (Mr L'Amy) was the sheriff of the county; that one of the gentlemen with him whom he pointed out, was Mr Duncan M'Neill, who was his, Yoolow's counsel; and that the other was Mr Patrick Robertson, who was the counsel for Peter Duncan.

" The Sheriff then asked David Yoolow various questions, suggested by himself and the counsel; after which the jurors were introduced, and in their presence the Sheriff repeated some of the questions he had already put, and also put others. Questions were likewise put by the counsel, and by some of the jurors. The interview lasted about an hour.

" Yoolow was asked if he was aware that there was a proceeding going on at Coupar-Angus for the purpose of trying his case? He answered, ' Yes,—and I hope you will soon bring it to an end.' He was asked, if he knew that the object of the trial was to ascertain the state of his mind? He answered, ' My mind is strong enough, though my body and bones are weak.'

" In answer to other questions put to him, he stated that he had been at school at Kettins till he was about nine years of age, and that he had learned to read, but had not been taught arithmetic. He mentioned the name of the schoolmaster of the parish, and also that of the present minister, Mr Symmers. He stated the dates, and the length of time since the death of his father and sister respectively. He said that his sister, Miss Yoolow, had been kind to him. He stated that his father had left him L. 600, which was in the bank; that he formerly got L. 20 of interest, but last year only L. 12. The sheriff having remarked that this was two per cent. interest, he said it was.* The sheriff then put down seven shillings successively, which Yoolow reckoned up; whereupon a half-crown and a sixpence were put down, and he readily added to the seven shillings the half-crown and the sixpence, and said that the whole was ten shillings. Being shewn a guinea note of the National Bank, he said it was a guinea note, and that the value of it was a pound and a shilling. At first sight he said it was a note of the Commercial Bank, but almost immediately corrected himself, and said it was of the National Bank. He was asked as to the extent of his farms, which he stated correctly, and said that one of them was held from Mr Murray, and another from 'the Laird of Pitcur.' He stated the amount of rent payable to each landlord, and that part was payable in money and part in grain, and specified the quantities of grain. Being asked what would happen if he did not pay the laird (landlord) the rent of the farm? He answered that he would be turned out. Being asked, if he were the landlord what would he do with the farm? He answered, 'I would let it, I suppose.' Being asked whether he read the newspapers? He answered that he did—the Weekly Journal. He was asked what it was that he read in the newspaper? He answered that it was the price of grain. Being asked what was the price of wheat? He answered thirty-eight shillings a quarter. Being asked how much is in a quarter of wheat? He answered eight bushels. To the question whether he read his Bible? He answered that he did. Being asked if he understood what he read? He answered, 'I think I do.' He was asked whether the soul perished with the body? He answered that it did not. Being asked what became of it? He answered, 'If you are good it goes into happiness, if not into misery.' He was asked how many ploughs he had labouring, and how many horses? which he answered correctly. Being asked who were his sister's trustees? he named them all. Being asked what he would do with his money at his death? He answered, 'I cannot take it with me.' He was asked if he were dying, would he not think it right to leave some part of his money to his relations? He answered, 'part of it.' He was asked, if a deed were offered him to sign giving away his property, would he sign it? He said, 'I should like to know what was in it.' Being asked how his money is applied? He answered, 'In providing raiment to me and the like.' He was asked the distance from Mill of Peattie to Coupar-Angus? which he answered correctly. He was asked the distance to Dundee; and answered that he did not know. He was asked if there was any town farther off than Dundee? He answered, 'Yes, Edinburgh, but I never was there; and Glasgow, and Greenock, and Paisley."

---

* Compare this with his ignorance of the rate of interest received by him, displayed in his interview with Dr Christison. His assenting to the Sheriff's remark does not prove that he really knew the per centage.

"The interview then terminated, and the jury, along with the sheriff, and clerk, and counsel for the parties, left Mill of Peattie* and returned into court, after an absence of between two and three hours."—Pp. 10, 11, 12.

Now it appears to us that this examination afforded ample proof that Yoolow was not in that condition in which the law holds it necessary for a man to be, before he can be pronounced *furiosus, fatuus et naturaliter idiota*. The very supposition that he had been tutored for the examination, supposing it to have been possible, would be itself tacitly admitting that he was capable of a certain degree of mental improvement, wholly inconsistent with that state of idiocy which the law in this process contemplates. This is a conclusion which no evidence could have overturned, and the case therefore might have been concluded at this stage. Though the examination shows that Yoolow was not in the condition of an idiot, it does not prove his intellect not to have been as weak as his information was limited. But the state of his mind we shall be in a better condition to estimate correctly when we shall have examined the rest of the evidence.

---

* "When the party were leaving the room Yoolow called back Mr M'Neill, and said to him, 'You are my counsel, and I hope you will do what you can for me.—I hope I'll not be plagued with these people coming back again.'"

Dr Christison was the first witness called, and as he is an important authority in medical jurisprudence, we shall give the greater part of his evidence at length.

"I was lately called on to visit David Yoolow, and visited him yesterday. I was with him first for about ten minutes; and, after an interval of about fifteen minutes, I was with him again for about half an hour. He is labouring under bodily defects. He is subject to irregular muscular actions, apparently arising from a want of power to direct the muscles to the object he seemed to have in view. There has been partial paralysis of the fingers and arms, but I did not examine particularly the extent of this. There was a convulsive motion of the features, and a rolling of the eyes especially when excited. I more particularly directed my attention to the state of his mind. I had such a detail and length of conversation with him as to satisfy myself in regard to the state of his mind. I am of opinion that he labours under a great degree of imbecility, and is unable to manage his affairs. My opinion is grounded on various circumstances. First, His replies to certain ordinary and simple questions on points that ought to be within his comprehension. On the second interview, I asked him if he took any interest in farming matters? He said, Yes; but he could not go out. I said, 'You are told what is going on.' He answered, 'Whiles,' (sometimes.) Then I asked him how many lambs he sold last season, to which he said, 'he did not know;' but I thought that was a matter he ought to have known, being a farmer. I asked him, 'Suppose you got twenty shillings for each of your lambs, how much would that be a score? He turned to a female servant, without whose presence we were informed by Charles Scott that he could not stand any examination, and said to her, 'Would that be twenty pund?' (pounds.) The servant said, 'You should not ask me.' He then turned to me and said, 'Would not that be twenty pund?' On every occasion when he seemed to be in the least at a loss for an answer, he turned to this female servant, and applied to her for an answer. She always replied, 'You should not ask me, master, but answer yourself.' When he did answer readily, it was in the shape of a question to me, and immediately afterwards he turned round to the servant. I asked him, 'Suppose your shepherd should take a score of sheep to the market and sell four, how many should he bring back?' He answered, 'Would not that be sixteen?' I said, 'Being a farmer, you can tell me how many bolls of wheat would afford a good return per acre?' He said, 'No: for we had very little white crop last season.' I asked him, 'How much wheat should be used per acre in sowing?' To which he answered, 'A boll.' Then I asked him, 'What would be a good return?' He answered, 'Twa (two) bolls;'* and this he repeated on being asked the question again, and said, 'It would be a very good return.' He was then asked, 'How many horses were on the farms?' To which he answered, 'Four on the one and five on the other,' which I understood to be correct. He was then asked, 'How many acres the farms consisted of?' To which he answered, '230 acres.' He was then asked, 'How many yoke of horses would be required to work the farms?' He could not tell. I asked him 'How many pounds a hundred guineas made?' He then turned to the servant, and said he 'could not tell;' but immediately he said with seeming pleasure, 'I can tell you how much a guinea is—a pound and a shilling.' I then repeated, 'How many pounds more than a hundred is a hundred guineas?' He said, 'I cannot tell you how many more or less.' I asked him then what interest he got for his money in the bank? He answered, 'Twenty pounds.' I then asked him 'Whether that was for the year or half-year?' and he answered, 'Oh! for the year.' 'And what money have you in the bank?' He answered, 'L. 1200.' Then Mr Symmons asked, 'How much that was the hundred?' He said 'he could not tell; and added, that he was no good hand at arithmetic.' I asked if he ever read the newspapers? He answered with seeming pleasure, 'Oh, yes.' I asked, 'Are you a great politician?' He answered, 'I never meddle with politics.' I asked him if he 'knew who was prime minister just now?' He thought a little and then answered, 'No: but I can tell you fine who is king,—it's King William;' and this was said with seeming pleasure, which appeared childish. I said, 'Although you do not meddle with politics, there are some branches of them which, as a farmer, you should know about; for instance, what is your opinion of the Corn Bill?' He answered, 'I ken naething about that.' I asked, 'What is it intended for?' He answered, 'To sell the corn, I fancy.' He was asked regarding the price of wheat, and he could not tell. Who sold his corn and cattle for him? He answered, 'Charles Scott.' 'When Charles Scott comes from selling your corn and cattle at the market, does he tell you what they are sold for?' He hesitated for a considerable time, and then said, 'Whiles,' (sometimes.) 'Do you ever take notice of the price or find fault?' He at first hesitated, and then said 'No,' and afterwards added, 'I am aye content when Charles Scott kens.' A long time was spent in putting these questions in a simple manner, and repeating them, so that he might understand them. Another question was asked him, 'What do you feed the sheep upon when snow is on the ground, as at present?' To which he answered, 'Neeps (turnips) I'm thinking.'—From the tenor of this conversation, Do you think Yoolow is capable of buying and selling, or entering into any ordinary transaction? Certainly not. I asked if he gave any directions about the farm? He answered 'No.' What are the other circumstances on which your opinion of his incapacity rests besides the above? His expression of countenance, which was such as I never saw in any man who was not considerably imbecile; and also, the irregular movements of his arms, and limbs, and face, which, though by themselves of less importance, yet, when taken along with other circumstances, indicate the state of mind I have described; also his apparent dependence on others for keeping him in an even train; and lastly, and chiefly, his easy excitability, and the apparent complete overwhelming of what mind he has when in that state. What was the cause of his excitement when you first went to call for him? It was either our arrival, or the conduct of Charles Scott, or both. Charles Scott's conduct was in resisting my entry into the house, though I told him who I was, and that I had a note from Mr Kerr, Yoolow's agent, which I exhibited. The note is in these terms, 'Charles Scott will be so good as give Dr Christison free access to David Yoolow. (Signed) CHRIS. KERR.'* Scott said I could not be admitted as Yoolow was then at his reading, and could not be disturbed then. Dr Anderson was present, and said he would speak to Yoolow and get me admitted, and afterwards returned and said we would be admitted. We then went into Yoolow's room followed by Scott, who, in a loud voice said, 'You cannot disturb him at his reading, and you cannot at present ask him any questions.' Yoolow had at this time a book before him, and turned round obviously alarmed at our presence. He ceased his reading. I put questions to him softly, in order to compose him, but Scott instantly interposed and said, 'He cannot answer your questions while he is at his reading.' Yoolow did not check Charles Scott, but when he went out Yoolow called for him. From this I infer Scott had a control over him. I then told Scott he had interfered too much, and it was not for his interest to do so. He then ceased for a time to interfere. I then asked Yoolow (who had the book still in his hand) to read a little, with the view of composing him. He read aloud for a little. I did not understand what he was saying, but on looking over the book I was satisfied he was reading tolerably correctly. The book was a Catechism. I asked to see it, and he did not answer me. I tried to take it out of his hands, but he resisted very violently. His resistance was like a child refusing to part with a play-thing, but he showed no bad humour. Scott then interfered again, saying 'You must not interrupt him while reading, he cannot answer any questions till he has done reading, and then he'll answer questions.' After another altercation between us, Yoolow said to the female servant, 'Take them out.' The servant said, 'they will go if you order them.' Yoolow then said 'then I order them.' In consequence of what Scott had said, that Yoolow would not answer till his reading was over, we left the room. I attached no importance to what Yoolow said, as the order he gave was put into his mouth by the female servant, for he had not previously expressed any disapprobation of our presence, or any wish that I should leave the room. Nothing at this interview occurred, calculated to excite a man of sound mind. Yoolow suggested no subject of conversation, except, that, upon the second interview, he asked me to draw near the fire; and upon our going away, and my shaking him by the hand, and wishing him good night, he said 'I hope, gentlemen, you will take no offence, and that this will not injure me.' I did not explain to him the reason which led me to visit him, or that there was any trial depending, and I do not know whether he understood it or not. An uncommon degree of memory sometimes accompanies persons of unsound mind, particularly memory of the contents of the Scriptures, which I was informed Mr Yoolow possessed. It was partly on that account, and partly because I was otherwise satisfied he was of unsound mind, that I refrained from asking him any questions upon the subject or the Scriptures. From all I saw and heard, I have no hesitation in giving it as my unqualified opinion, that he is of unsound mind, and from that cause incapable of managing his affairs.

---

* The defender's counsel attempted to get rid of the effect of this answer, by supposing that Dr Christison had misunderstood him, and that he had answered twa (12) not *twa*.

---

* It appears from this that Yoolow was under the control of Scott. In fact, from the terms of the note, written, be it observed, by his law agent, Scott would seem to have been Yoolow's keeper.

" Interrogated by a juryman:—Yoolow understood the questions I put to him. In general I had not much difficulty in making him understand the questions, as they were generally repeated twice.

" Interrogated by the Chancellor of the jury:—He was asked how many yoke of horses would be required to work the farm? at first he was asked how many *team*? and one of the gentlemen present having remarked that team was not a common expression in that part of the country, he was asked how many *yoke*? The chancellor of the jury then observed, that *yoke* was not a phrase used by the people in that part of the country."—Pp. 12, 13, 14, 15.

The mode of examination adopted by Dr Christison, and the inferences which he drew from the facts observed by him, have been made the subject of pretty free criticism, both during and since the time of the trial. It has been said that the questions put by him to Yoolow were not such as ought to have been addressed to a man in his situation, and the counsel for the defendant in his speech takes occasion to remark, that " Dr Christison, after separately exhausting the three departments of agriculture, arithmetic, and politics, proceeded to put questions to the supposed idiot on the more complex subject of political economy." Now a perusal of the evidence quoted above will show that this is an exaggerated account of the method of proceeding adopted by the witness. He did not exhaust the subjects mentioned, but contented himself with merely introducing them, with the view of ascertaining, by the answers of Yoolow, the precise state of his mind. Dr Christison's object, we repeat, seems to have been to ascertain exactly the calibre of the defender's mind, and not simply whether he was an *idiot* or not; and to the manner in which he did this we see no rational objection. On what subjects, we pray, was he to have conversed with Yoolow? He was brought to see an individual who had lived all his life in the country, and the first subject which would naturally suggest itself would be rural affairs. It has been said that Yoolow was not a farmer, that he was only beginning to be one, and that therefore he could not be supposed to be conversant with agricultural matters. But the fact of his being a farmer or not appears to us to be of little consequence. Yoolow acknowledged that he took an interest in farming matters, and it would be strange, indeed, if a man living in the country, however great a recluse he might be, especially if his intellect was of a limited nature, did not do so. Had Dr Christison introduced the subject of commerce or of manufactures, he might have been liable to the censure which was passed on him. But we have no doubt, that, even if the weather had been made the subject of conversation, and Yoolow had made the most absurd remarks, the ingenuity of the counsel would have been displayed in showing, that the defender had been examined in meteorology, and that, not being a scientific man, it could not be expected that his answers should be correct.

In respect to arithmetic, again, the questions were such as might have been put to any agricultural labourer in this part of the country. The question regarding the per centage of interest, we do not consider to be an arithmetical one; for, supposing an agricultural labourer to have accumulated a small sum by the savings of his earnings, and to have lent it out on interest, it is not at all likely that he would be ignorant of the per centage, though he might be unable to calculate a question of interest.

A medical witness, who followed, and who was 76 years of age, was unable to calculate the per centage, and it was hence inferred that Yoolow's not being able to do it was not at all wonderful. But in this there is a great fallacy. Yoolow was not asked to *calculate* the per centage; he was asked merely how much it was. Between the two questions there is a marked difference. A man might not be able to *calculate* the per centage, though he might *know* its amount, and undoubtedly, if fit to be trusted with the management of his property, would know it.

In respect, again, to what has been so pompously denominated by the defender's counsel the department of politics, the questions were simple. It is quite possible that a man in his senses might be ingnorant who the Prime Minister at the time was, as changes in the cabinet are in these days by no means rare; but no man who was not imbecile would have made the reply which Yoolow did. Being asked if he could tell who was Prime Minister, he thought a little, and then answered, "No; but I can tell you fine who is King—its King William," and this was said with seeming pleasure, which appeared childish. The reader, on consulting Dr Christison's evidence given above, will observe that even these simple questions were not put till after Yoolow had acknowledged that he read the newspapers, which occupation appeared in his mind to be associated with pleasure, and it was quite proper to ascertain if he understood what he read.

We now come to that part of Dr Christison's evidence, on which the defender's counsel threw the greatest ridicule.

" Dr Christison," says Mr D. M'Neill, " after separately exhausting the three departments of agriculture, arithmetic, and politics, proceeded to put questions to the supposed idiot on the more complex subject of political economy. This part I shall read to you in the Doctor's own words ; ' I said, although you do not meddle with politics, there are some branches of them, which as a farmer' —David Yoolow, however, never was a farmer, he is only going to become a farmer now, but Dr Christison erroneously supposes him to have been a farmer,—' which as a farmer you should know about ; for instance what is your opinion of the corn bill ?' There is a question for you ! There is a question to be put to an idiot ! There is a question to be put to an uneducated countryman, who had no experience in corn or in trade of any kind ! Pray, Mr David Yoolow, what is your opinion of the corn bill ? That is a branch of politics, which you ought to understand ! Really, gentlemen, there is in this something so ludicrous, that, unless we had heard of it from Dr Christison himself, I could scarcely have credited it. I am sure that if my learned friend opposite had told me that Dr Christison had put such a question to a supposed idiot, after having tried him in the several departments of agriculture, arithmetic, and politics, I should have thought that my learned friend was giving vent to his known humour, and would have given him credit for another excellent joke. The vague terms too, in which the question was expressed, might have puzzled even Mr Western to have answered it. Pray, Sir, what is your opinion of the corn bill ? without deigning to say in what respect. Pray, Sir, what is your opinion of things in general ? would be almost as specific and intelligible a question. David Yoolow, when thus assailed on the subject of the corn bill, which I daresay, had never before cost him a thought, honestly answered, ' I ken naething about that.' But that answer did not deter the doctor from pressing the subject. ' I asked him,' says he, ' what is it intended for ?' That certainly was somewhat more specific ; and what was the answer ? ' He answered to sell the corn I fancy.' A better answer Cobbett himself could not have given, and none of my learned friends, or of the learned Doctors examined in this cause, have attempted to impugn it."—Pp. 81–82.

Now, stripped of all verbiage and rhetorical ornament, the meaning of the passage just quoted is simply this. It was absurd to ask a supposed idiot any general question respecting the corn bill. David Yoolow answered the question in a satisfactory manner according to the counsel, and therefore it is insinuated, David Yoolow is a man of a sound mind. We deny the truth of the two propositions and the inference thus insinuated. We have already stated that the object of Dr Christison in his interview with the defender seems to have been not to ascertain merely whether he was what the law denominates *furiosus, fatuus et naturaliter idiota*, but what amount of intellect he possessed, and there could be nothing absurd in asking him his opinion of an enactment which is generally supposed to be so beneficial to the agricultural class to which David Yoolow belongs. It is true the counsel tells us that his client was not a farmer, but only going to become a farmer. The distinction attempted to be drawn is unimportant. The defender having lived long in an agricultural district, and occupying a farm, might have been supposed to know something of what forms a common subject of conversation among those engaged in agricultural pursuits. If altogether ignorant of the existence of the corn bill, it was no proof of a sound mind to enter upon an occupation which is so much influenced by it. We see nothing in his answer which could indicate whether Yoolow's mind was sound or not. It is vague, and may or may not be correct, according to the interpretation which may be given it. Even if correct, it was merely a lucky guess, a random statement, uttered without the slightest consideration,—a stumbling upon the truth. Now, it is well known, that not merely imbecile individuals, but those who, in the strictest interpretation of the law, are idiots, not only stumble upon the truth occasionally, but now and then give utterance to most sarcastic, and even what appear witty observations. But this does not prove them to be sane. Coupling, therefore, Yoolow's answer about the corn bill, with his other answers, we do not see that it affords any indication of the possession of a sound mind, but rather the reverse.

It may be asked why Dr Christison did not converse with him on the subject of religion? But, being aware that David Yoolow made the perusal of the Bible and Catechism his almost sole occupation, he knew too much about insanity to suppose this would form a proper test of the state of his intellect, inasmuch as imbecile and monomaniacal individuals may, by the exercise of mere memory, exhibit an apparent knowledge of a particular subject, which might hardly be equalled by men of sound mind.

Dr Christison, however, did not form his conclusion from the answers only of Yoolow. He took into consideration his appearance and the state of his health, which afford indications of no small value in cases like the present. When we add to these the control which the defender's domestics appeared to exercise over him, and his easy excitability, the proof is complete. It is said by the counsel, that Dr Christison, by attempting to take the book out of Yoolow's hands, produced the excitement which he describes. This, however, does not appear in evidence; for when Dr Christison tried to take the book from him which he was reading, though he resisted very violently, he did so like a child refusing to part with its plaything, and did not exhibit any bad humour.

Considering, then, that Yoolow's answers exhibited upon the whole a great degree of imbecility,—that the expression of his countenance was decidedly that of an imbecile,—that he appeared to be under the control of his servants,—that he had been paralytic from his childhood,—we conceive that Dr Christison was perfectly justified in giving it as his unqualified opinion, not that David Yoolow was an idiot, but that he was of unsound mind, and incapable of managing his affairs.

The next witness was Dr William Malcolm, physician to the Perth Lunatic Asylum, whose evidence corroborates that of Dr Christison. We extract such portions of it as throw additional light on the question.

* * * "I asked him some questions in common addition, such as how many 48 and 52 make? On which he turned round to Charles Scott, who asked him what 50 and 50 made? and he could not tell. I then asked him what the price of meal was, as he was both a miller and a farmer? He turned round to Charles Scott and muttered, what I supposed to be a question put by him to Charles Scott; and then said, 'I don't know.' I then asked him as to the state of the corn and potato crops? On which he again turned round to Charles Scott, and asked him, but I got no answer. I then got him on the subject of the Bible; and at my desire he read part of it, and seemed to know the meaning of what he read. But this did not shake my opinion as to his being a man of unsound mind, as it is not uncommon for lunatics and other persons of unsound mind to be acquainted with the Bible. There are several persons of this description in a state of hopeless *insanity*, and insane upon every point but the Bible; but I hold an *idiot* to be a person who is totally void of understanding. I asked him if he had heard of the Reform Bill, and that farmers of his extent of land were entitled to a vote? But this seemed to be all a blank to him. Yoolow's appearance, also, is very much that of an imbecile person. I understood that when Yoolow was about eight or nine years of age he had a fever, which ended in decrepitude and paralysis, which weakened his mind. He appeared very much excited when I saw him. There was a profuse perspiration on his forehead, and his hands and feet were constantly moving about; and I was afraid of his falling from his chair. There was no cause at all for this excitement. At this interview I was perfectly satisfied that Yoolow was a man of unsound mind. I again saw him on the 9th of November. He expressed no surprise at my visit, but he was very much excited; and I thought it strange that he was not surprised at my second visit. I did not tell him the object of my visit, but somebody mentioned that I was Dr Malcolm. Yoolow said to

Charles Scott, 'Will he hurt's?' (hurt me;) but I spoke kindly to him, and he seemed satisfied. I asked him how much money he had? He said, 'I got money'—'I got money,' and looked at Charles Scott, apparently to assist him with the answer. Dr James Anderson then asked him how much money was in the house at the death of his sister, and if he was aware whether Mr Duncan had taken away L. 960? Upon which Charles Scott interfered, and told Dr Anderson, that Yoolow was not aware of Duncan having carried away any money from the house, and that if that question were asked, it might throw him into a fit. I asked him with regard to the number of his cattle and horses, but he did not seem to know any thing about them. My opinion of his being of unsound mind was confirmed by what passed at this interview. I again saw him on the 15th November, when the line of questions was the same, and my opinion of his imbecility again confirmed. I again saw him on Wednesday last, and from what then passed, I continued to be of the same opinion. I saw him again on the 26th day of this month, at the desire of Mr Kerr, agent for Yoolow, and Mr Kerr was also present; but my opinion was nowise shaken by what then took place. Imbecility of mind is compatible with acquiring things by rote. Yoolow has a great memory. At last interview, he could answer questions that he could not answer at the former interviews. At one of the interviews after the first I resumed the subject of the Reform Bill, and he said he knew that the Reform Bill had passed. He also knew the price of meal. He appeared to have been told that. I also saw him yesterday along with Dr Christison, and my opinion remains the same. He never originated any subject of conversation at any of those interviews. I don't think he is in a condition to buy or sell, or enter into any ordinary transaction. He seemed to be perfectly under the influence and control of two servants, to whom he referred at all times when the questions were put. I am of opinion that David Yoolow is a man of unsound mind, and incapable of managing his own affairs; and this is my unqualified opinion. In my opinion there is no chance of his recovering or improving."—Pp. 16, 17.

On cross-examination Dr Malcolm stated, that "In the Perth Asylum there are two or three lunatics who have great knowledge of the Scriptures. One of these is insane on every other point; and if you ask him a question on any subject, he answers by quoting a passage from the Bible, mentioning chapter and verse. Another of the persons in the same asylum, to whom I alluded in my examination in chief, as conversant with the Scriptures, is a monomaniac, and thinks that people are laying plots to poison him. There is another person there also conversant with the Scriptures; he is about 52 years of age, and has been insane for about twelve years. The person who answers you by quoting a passage of Scripture, has been about fourteen years insane, and he is between 40 and 50 years of age."—Pp. 17, 18.

Dr Malcolm's evidence requires no comment from us. It is clear and to the point, and no one who peruses it can entertain the smallest doubt of Yoolow's imbecility. It moreover furnishes a complete refutation of the inferences drawn by the defender's witnesses and counsel, from other facts deponed to, which we shall notice more particularly when we come to the consideration of that part of the evidence.

Mr Caleb Symmons, the superintendent of the Perth Lunatic Asylum, who had been ten years in the charge of that institution, and five in a similar situation near London, corroborated the testimony of Doctors Christison and Malcolm, and gave it as his opinion, that Yoolow was totally incapable of managing his own affairs. The import of the evidence of Mr Millar of Perth, who had been twenty years in practice, was the same; and Mr Blair, who had been the assistant clergyman of the parish for several years, stated it to be his impression that Yoolow was of weak mind, and quite incompetent to manage his own affairs.

The next witnesses were Mrs Euphemia Easson or Blair, who had known Yoolow since he was between seven and nine years old; Isabel Ferguson, who had been his servant, and had charge of him; William Small, who had been Miss Yoolow's farm-servant; and Agnes Small, the wife of William Small; Ann Stewart and Elizabeth Robertson, who had been at different periods in the service of Miss Yoolow. Though no great confidence may be placed in the opinions formed by these witnesses, respecting the defender's state, yet the facts to which they depone are valuable. The most important of these we shall now state briefly.

The first witness reckoned him a boy of weak intellect, even before he became paralytic, and he was usually denominated "Daft Davie Yoolow." His sister never spoke of him as capable of managing his own affairs. From her and the others it appeared that he took no charge of the farm, and gave no instructions to the servants, who used to humour him as they would have done a child. His manners were like those of a child. When he was disappointed or crossed in any way, or if any one went between him and the light, he went to bed. He liked all the cattle and dogs to be white. He had no shame or sense of propriety in regard to the calls of nature before the servants, male or female, or before his sister. He laughed and appeared pleased after doing any thing indecent, as if it had been a good joke. He frequently committed indecencies before the servants. His other amusements were rubbing his beard on the faces or hands of the servants, both male and female, and in what he termed *grosing* them, or putting their heads under his arms and squeezing them; and in this they all humoured him. He also occasionally, taking something in his hands, would bid them draw, and when they pretended to exert themselves, and told him that he was strong, he appeared pleased, and said that he was not weak. He sometimes imitated the barking of a dog. He was in the habit of spelling little words of a similar sound, as p-a-r-k, d-a-r-k. He sometimes shut his eyes, and asked the bystanders if they could see him. He would not eat fruit, because the eating of fruit caused the fall of man. He disliked all swearers, and thought them not "canny." He asked one of the witnesses who had her child of the age of four months in her arms, if the infant could read the Bible. He was in the habit of asking the servants every time they appeared, though it were a dozen times in the day, "how they were, and if they had travelled far," and when any of them went out, he told the individual to take care not to fall. His only serious occupation was reading the Scriptures, collections of hymns and catechisms. One of the witnesses, the wife of William Small, thought that he showed in one instance more mind than a child, namely, in explaining the Scriptures. He was not ill tempered.

The evidence, the substance of which we have just condensed, completely corroborates the view entertained by the medical witnesses, whose testimony we have given. Every circumstance except one shows his mind to have been imbecile, and, to use the phraseology of Hoffbauer, deficient both in intensity and extensity. The only circumstance which forms an apparent exception is, that he explained the Scriptures. But we ask what could have been the nature of an explanation given by an individual in the state of mind that Yoolow was? If it were correct and rational, it must have been the mere repetition of the interpretations given in catechisms, and then it only proved that he was in possession, to a considerable degree, of memory, which, as stated above, is not at all incompatible with a great amount of imbecility. We know well what it is which people in the rank of life of the witness who stated the fact, call interpreting the Scriptures. The merest common-place remark in accordance with the standards of the Church, especially if couched in the same language as there employed, would be looked on as satisfactory evidence of the individual's understanding it, although both the passage apparently explained, and the explanation given, might convey to his mind not one definite notion.

But though we consider this evidence as proving distinctly, even if taken by itself, the imbecility of Yoolow's mind, it, like the rest, affords an answer to the charge of idiocy, and, accordingly, we think that the case might have been stopped here, if it had not been deemed prudent to do so, after the examination of the defender. The examination of witnesses, however, proceeded, and the next called was Mr Bruce, messenger-at-arms, whose evidence is quite unimportant. He had been at school with Yoolow, and considered him a silly boy, before the paralytic attack; though on cross-examination he would not swear that the defender was not as clever as himself when they were boys.

The last three witnesses were medical men; and we shall give such parts of their evidence as are most important. The first was Mr Anderson, surgeon, Coupar-Angus, aged 76. We mention his age, because it is of importance to be kept in mind, when considering his cross-examination and the remarks of the defender's counsel.

About forty-three or forty-four years ago he had been called with the late Dr Crockatt to visit Yoolow, in consequence of an attack of paralysis. They attended the patient for four or five weeks, and employed all means for his cure. The witness had various opportunities of seeing the defender since, and had been all along of opinion that his mind was weak. He was at no time capable of transacting any business. He was timid and excitable in his temper, childish in his manners and habits, and he did not converse on ordinary topics as persons in the possession of their faculties do. He followed no occupation, except reading the Scriptures. His memory was pretty good, and the witness thought that he might have been tutored to repeat things by rote. The attack which Yoolow had in boyhood was, in the witness's opinion, precisely one likely to bring on imbecility. Dr Stewart of Dundee was consulted at the time, and both he, the witness, and his partner, the late Dr Crockatt, were of opinion that Yoolow's case was that of an imbecile person, which nothing could cure, and that it was unnecessary to incur expences, either in medicines, treatment, or education, and upon that opinion his friends acted. His father and mother were perfectly satisfied of the weakness of his mind. The witness could not say whether Miss Yoolow entertained the same opinion.

The statements of this witness were not shaken by his cross-examination, which appears to us to have been conducted with a degree of harshness from which his age ought to have protected him. He got into confusion, and it is well known that, in such circumstances, it is the object of the opposite counsel to make the most of it. His cross-examination was as follows:—

"I think there are some things that David Yoolow does understand. What are those things? I think he understands *some* of the things that he reads in the Scriptures. Do you understand *all* of the things that you read in the Scriptures? I do not. What are the other things that you think David Yoolow understands? I am not sufficiently acquainted with him to know what are the other things that he understands. He understands the difference of five shillings and ten shillings. I am not sure that he understands how many pence are in a shilling. Did you put questions to him to try whether he knew the value of money? I did. What questions did you

put? I put the questions to him, how many shillings were in five shillings, and how many shillings were in ten shillings; but he had difficulty in answering how many shillings were in ten shillings, though he said that ten shillings was half a pound. How did you put the question to him as to how many shillings were in ten shillings, or in five shillings? What words did you use? I used the words, 'How many shillings are in ten shillings?' and 'How many shillings are in five shillings?' And he did not know how many? He did not. Then he knew that ten shillings was half a pound, but he did not know that ten shillings was ten shillings; was it so? Yes. You may take time to answer the questions I am now going to put. If L. 1200 is laid out at interest, and yields L. 20 of interest yearly, how much is that per cent. by the year? I am not able to calculate that, without pen and ink, not being conversant with such matters. If you had the use of pen and ink, could you calculate it?—there are pen and ink, take them. I cannot say that I could calculate it with the use of pen and ink. Did you put any questions to David Yoolow to ascertain his notions of right and wrong? I did not. Did you ask him if he had any knowledge of or belief in a future state? I did not.

"Re-examined by Mr Robertson, and desired to explain his answers relative to the ten shillings. I must have meant to say that Yoolow did not understand that ten shillings made half a pound, but that he did know how many shillings made ten shillings.

"Re-cross by Mr D. M'Neill.—You said that you also asked him how many shillings were in five shillings, and that he did not know—what explanation do you give as to that? I must have fallen into a mistake when I said that I asked how many shillings were in five shillings. What, then, was the question you asked David Yoolow relative to the five shillings, and what was his answer? I am embarrassed, and cannot tell."—P. 24.

Now the confusion of this witness does not affect the case, and admits of an easy explanation. He allows that Yoolow understands some matters and instances, that he had a partial understanding of the Scriptures. The counsel then turns upon him very dexterously, and asks him if he understands *every thing* he meets with in the Bible. He does not, and the inference which the counsel wishes the jury to draw is, that David Yoolow understands the Scriptures as well as the witness. This sophism, though insinuated according to the most approved method of forensic jugglery, could not have imposed on any one possessed of the usual amount of reflection. The flippancy of the question had, however, one effect. It confounded the aged witness, and rendered his subsequent statements confused and unsatisfactory, in reference to the facts which he then mentioned. But his evidence in chief remained unshaken, and it corroborates to the fullest extent the testimony of previous witnesses. Of the inference drawn from the fact of his not being able to calculate the per centage of interest we have already disposed.

The next witness, Mr Purves, surgeon, entertained the same opinion as the previous witnesses, respecting the imbecility of Yoolow. His conclusion was drawn from the defender's ignorance of matters in general, the utter ignorance of the affairs of his farm, the entire childishness of his manner and conversation, from his asking childish questions, and being pleased with trifles. As a specimen of the last we give the following portion of the evidence of this witness.

"I used to put simple questions to him as to the Bible, to please him and gain his confidence, and he would ask me sometimes if I was a good doctor; and he would do this twice at the same interview, and he would interrupt me and do this when I was asking other questions. I was present with Mr Ballardie; and Mr Ballardie had shining buttons on his coat. Yoolow took hold of them, and said, they were 'braw buttons' or 'bonny buttons.'"—P. 25.

It appears from the evidence of this witness, too, that Yoolow could answer questions at the last interview, which he could not do before; that Scott, the overseer of his farm, and the maid-servant, occasionally interfered and enabled him to answer questions, and that he seemed to refer to them whenever he was puzzled. Though Mill of Peattie, where he lives, is on the estate of Lord D. G. Hallyburton, the Member for the county, and within two miles of his residence, he could not tell who was Member, and asked if it was Melbourne. It is but justice, however, to state, that the maid-servant could not answer the same question.

The last witness for the pursuer was Dr James Anderson, physician, Coupar Angus, Yoolow's ordinary medical attendant, who stated that this affection was occasioned by a fall on the ice in his childhood. The following extract comprises the more important parts of his evidence.

"He has a memory without understanding. He is incapable of following a train of thought for any considerable time, or of reasoning with accuracy or judgment. * * * He has a great repugnance to meet strangers at first, but after once or twice meeting with them he becomes indifferent. I was present when Dr Malcolm was first introduced to him, and I went there an hour before to prepare him for his visit, and he was made to understand that Dr Malcolm was to call. The sound of a cart having been heard, it was supposed to be Dr Malcolm's carriage coming, and the maid-servant having attempted to go out to meet him, David Yoolow looked up to her piteously, putting a chair in before her to intercept her, and cried out, 'O, dinna (don't) leave me, dinna leave me.' The maid said, 'I am not going to leave you, David, I am only going to see if they are come.' To which he said, 'Are they canny, are they canny.' He was in great agony. The servant girl endeavoured to soothe him, and said that I would take care of him, and that they were as canny as I was; and while she was absent, he drew in his chair and began his usual string of questions to me, 'Are you a good doctor—are you a good doctor?' I succeeded in soothing his mind at that time. He was in the habit of repeating the question, 'Are you a good doctor,' very often, sometimes as often as six times in as many minutes. He was accustomed to put other questions, to me such as, 'The hills, are they as far as the end of the world,' and sometimes, 'The hills, are not they as far as the end of the world.' He sometimes asked if 'Coupar was as far as the hills.' 'Dundee is farther than the hills, is it as far as the end of the world.' These questions were all put in a string and by rote. There was another set of questions he was in the habit of asking, such as, 'Are you a Doctor?' I suppose somebody had informed him I was the only 'Doctor' in Coupar Angus, the others being surgeons only; and he used to ask, 'Are you a doctor? Manna (must not) doctors rise when they are bidden?' I answered 'Certainly.' Then David asked, 'Must they do so when its snawing (snowing)? 'Certainly.' He then turned to the maid-servant and said twice exultingly, 'I hae na, (have not) to rise when its snawing.' The servant thereupon said, 'Na, David, ye have not to rise when its snawing; you're better off than Doctors,' which appeared to give him great delight. He was in the practice of very frequently putting those questions to me. He is subject to control, except when contradicted, and then he falls into a nervous fit, which is of the nature of maniacal."—Pp. 26–7.

Such is the state of David Yoolow's mind, as disclosed to us by the medical and other witnesses for the pursuer. It does not show that he was what the law denominates *furiosus*, *fatuus et naturaliter idiota*, but it distinctly proves him not only to have been a person of a facile disposition, but in a state of childish imbecility, which imperiously demanded the protection of the law. Let us examine, however, how far this conclusion is supported or invalidated by the evidence for the defence. The list of witnesses includes one clergyman, six medical men, and four others.

The Reverend James Flowerdew deponed, that David Yoolow possessed a very considerable acquaintance with the Scriptures, and that this was manifested not only by the quotations which he made, but by his application of the texts so quoted. He not only thoroughly understood the doctrines of Scripture, but gave reasons in support of his belief, not from texts merely, but other reasons which satisfied the witness that he had reflected and reasoned upon the subject. The witness thus proceeded.

"I examined him in particular upon the Fall, upon the Remedy or Atonement provided, upon the Divinity of our Saviour, upon the Resurrection of man, upon Miracles and the Second Advent. On these subjects I found that he could give sound reasons, which showed more than an average understanding of the subject. I asked him, why he believed in the divinity of Christ. He said because the Scriptures said so, and he quoted a text which was quite appropriate, and then said, that was enough, ‘the word of God hath said it.’ I asked him if he had any other reasons for believing in the divinity of Christ. He answered that Christ had done certain things, such as opening the eyes of the blind, and performed other miracles which he mentioned. I asked him whether any miracles were performed under the Jewish dispensation? He said there were. I then asked him if there was any difference between the miracles under the Jewish dispensation, and those under the gospel. He said there was. I asked him what that difference was. He answered that the first were miracles of judgment, and the others were miracles of mercy and compassion. There was another question I asked him, the answer to which struck me very much, and satisfied me that he was capable of something like a process of reasoning. I asked him if the apostles wrought miracles. He said they did. I then asked him if they used any name in working their miracles, and he said that they did,—that they used the name of Jesus, saying ‘in the name of Christ or Jesus,’ when they wrought their miracles. I then asked him if Christ used any name when he was going to work miracles, and he said, ‘No.’ I then asked him what he would infer from the different mode in which Christ wrought miracles, from the apostles—and he replied without the slightest hesitation, ‘a divine person.’ I then said, that according to his idea, the power of Christ to work miracles was inherent in himself, while that of the apostles was derived from another; and he answered, ‘Yes.’ I don't give the precise words of the conversation; we talked in homely language; and I do not recollect the very words that were used; but I state the substance correctly. I don't think that his answers arose from any mechanical acquaintance with texts, but that they showed a species of reasoning applicable to the subject; and the questions I put were such as occurred to my own mind, and were not dictated or suggested by others. I asked him, and he showed that he was quite aware of a future state; and he quoted a very appropriate text. I made reference to the story of Ananias and Sapphira, and I asked him whether the sudden death was a punishment for the sin; and he answered it was, and was due for the sin. In reference to the punishment of sin, he said that sin was misery in this life and misery in the life to come. In order to show how sensibly he spoke on the subject, I may mention that when I asked him whether the punishment for the fall was not greater than the offence, he replied, ‘I cannot answer that; it was the will of God.’ So far from showing any trace of imbecility or weakness of intellect, I considered that the answers given to my questions evidenced an average degree of information and intelligence, upon the points on which he was questioned.”—Pp. 28, 29.

It is necessary to examine narrowly the evidence just quoted, because it appears at first sight totally irreconcilable with the testimony of previous witnesses. That a man in a state of drivelling imbecility should stand an examination in scholastic divinity, is to us utterly incomprehensible, and we must therefore see whether in Mr Flowerdew's conclusions there be no fallacy.

In the first place, we must observe, that it would have been more satisfactory if the exact expressions of Yoolow, at least those containing his answers to questions deep and important in divinity, had been noted. We have no means of judging whether the questions were leading ones or not. It is quite possible that Yoolow's answers might have been mere expressions of assent to propositions put in the form of questions, and that this is probable we infer from what Mr Flowerdew himself has stated. The portion of the evidence to which we refer, is that in which he was led from one proposition to another, till at last he assented to the conclusion, that Christ was a divine person, and that the difference between the power of our Saviour and that of the apostles was, that in the one case it was inherent in the person using it, and in the other derived. Now we have heard young children at Sunday schools, children of limited capacity and limited acquirements, and in the poorer ranks of life, made to answer similar questions, by pursuing the same method as that adopted by Mr Flowerdew in the case of Yoolow; and it is a fact which will not be disputed, that individuals in the same state of mental imbecility as Yoolow, will assent to any proposition of an individual in whom they have confidence, especially if they entertain a feeling of respect or reverence for him. For Mr Flowerdew, from his office, the defender, constituted as his mind was, would entertain the deepest reverence, and the questions, leading ones, as we have good grounds to suspect them to be, would contain propositions to which he would yield a ready assent, since they harmonized with those doctrines which he was in the habit of perusing day after day in his catechisms. Nay, more, we doubt much, whether even if they had been somewhat opposed to them, David Yoolow would not have acquiesced. It will be observed, too, that the witness does not state that Yoolow started any topic for discussion or conversation, and so far his evidence corroborates that of the preceding witnesses.

Mr Flowerdew makes use of different expressions respecting David Yoolow's reasoning powers, each of them furnishing us with a different view of their amount. We have first, " more than an average understanding of the subject," then " capable of something like a process of reasoning," and, lastly, " so far from showing any trace of imbecility or weakness of intellect." If he was only capable of something like a process of reasoning, did that show no trace of imbecility or weakness of mind; and how is it reconcilable with an average degree of intelligence?

As we have just stated, Mr Flowerdew's evidence would have been more satisfactory, if he had given the *ipsissima verba* of the questions and answers, and we cannot understand why this was not done. His examination of Yoolow took place on the very morning of the day on which he gave his evidence, and he knew that he was to be called on to state what occurred. Yet he recollects nothing but yes and no, and the expressions "a divine person," "the word of God hath said it," "I cannot answer that; it was the will of God." Wherever the witness is particular in his narration, the answers will be found to be mere assents to the propositions contained in the questions. How, then, are we to account for the conclusions at which Mr Flowerdew arrived? It is impossible to entertain the slightest shadow of a doubt of this respectable witness giving a true account of his impressions. But we must make allowance for the professional medium through which he viewed the defender. It was very natural for him to think that the man engaged in the same studies as himself, and assenting to the same propositions, could not be imbecile; and as he would meet with thousands who could not show the same amount of verbal knowledge as Yoolow, to draw a comparison highly favourable to him.

We reconcile, then, the evidence of Mr Flowerdew with that given by former witnesses, by supposing the questions put to have been leading ones, or the answers to have been such as are usually met with in catechisms.

The next witness for the defence is Dr John Argyle Robertson, and, as his evidence is the most important on that side, we shall quote it at length.

"I have turned my attention to the subject of the diseases of the mind, and in part to matters connected with medical jurisprudence. I visited David Yoolow to-day, and endeavoured to satisfy myself as to the state of his mind, whether sound or unsound. I conversed with him on various subjects bearing on his memory, his judgment, his powers of comparison, and his habits of life. The general result is, that his memory is good, his powers of comparison are good, but his means for drawing comparisons are, from the habits of his life, not equal to those of the generality of men. By his habits of life, I mean his seclusion and want of experience and intercourse with the world. His attainments are therefore limited. He has a good capacity for receiving information,[*] and a memory to retain it. In testing his powers of comparison, I put questions to him,—for example, comparing the value of the Apocrypha with that of the Old and New Testament, the relative punishments likely to follow according to the knowledge of good and evil, and in regard to money matters. He understood money matters very well. I asked him the meaning of a receipt? He answered it was a discharge for sums paid. I asked him what was the use of a receipt? He said it was to prevent a second demand being made for payment. I asked him what would be the effect if I destroyed a bank note? He said, you would be a loser. I asked him what effect it would have upon the bank? He said the bank would be gainers. I asked him what was the meaning of being a cautioner? He said it was being a guarantee for another's debt. I asked him if the principal could not pay, what would happen? He said if the cautioner could not pay he would be put in jail. I asked him if he could count money? He said he knew little of arithmetic, he had never been taught it, but he could try it; and he did perfectly correctly some operations in addition and subtraction proposed by me at random. I asked him if he showed me a sample, was he bound to give the same article in the stock? He answered yes. I asked him what would be the consequence of his not doing so? He said he would be cheating. I asked him, if two things were given in exchange not of equal value, what would take place? He said something must be given to boot. Was the conclusion you came to, that the man was fatuous or an idiot? No, but quite the reverse. What I mean is, that he has all the capability of acquiring knowledge, but has not had the opportunity. By fatuity and idiocy I understand the want of power and capacity to acquire knowledge. When I was with him, Dr Bell and Mr Kerr, and a female servant were also present. Mr Kerr put some questions, but I pursued my own line of examination, and formed my opinion from the answers which he gave.

---

[*] On what subject?

" Cross-examined by Mr Robertson.—Yoolow was a little shy when I first went in, and said he had never seen me before; ' but I saw *you* (he said, pointing to Dr Bell,) last Tuesday.' Every question that I asked him he answered clearly; but I cannot answer the question as to his being a man of firm mind and purpose, as I did not ask him as to his purposes or intentions. One thing I recollect upon the subject of his purpose. I asked him whether it was a good thing to extend Christianity over the heathen world? He answered ' Certainly.' I asked him how that was to be done? He said, ' by those who could afford it subscribing money.' I asked him if he would subscribe money himself? He said if he had anything to spare perhaps he would. In regard to truth he was very decided; but I had no opportunity of judging whether he was a man of firm will, or could be easily imposed upon or not. He told me that some medical men had been plaguing him very much, and that he had said to him he had better go home and look after his pills, and not fash (plague) him. I asked him something upon the subject of farming, and he said, ' I know nothing about it, and you may as well ask me about Latin or Gaelic, which I have never learned.' I also asked him with regard to the hours on different watches shown him, and he pointed out the difference, some watches differing seven or eight minutes. I asked him the difference between home-made stockings and stockings bought in shops; and he explained to me the difference. I was introduced by Mr Kerr, who said I was a friend, and a doctor from Edinburgh. Did he make any remark as to Edinburgh? He said it was a far away place, and he had never been there. I don't think the purpose of my visit was mentioned. The subjects were originated by me and the others[*] present, and none by Mr Yoolow. I asked him if he read the Apocrypha? He said he had it in his power, but did not read it. I asked him the reason, and if it was because it was doubtful whether it was inspired? He said that was just the reason. I asked him about faith and good works, which he seemed to understand perfectly.

"Re-examined by Mr D. M'Neill.—He is very decrepit in his hands and limbs, and the movements of his limbs are irregular and frequent. Do you consider his state of body incompatible with mental capacity? Certainly not. Do you consider that an increased intercourse with the world would increase his powers of mind? I do. My reason for saying so is, that the subjects he has attended to he has mastered."—Pp. 29–31.

While we give Dr Robertson all due credit for the very humane manner in which he avoided hurting Yoolow's feelings by entering upon any subject of which he could possibly be ignorant, unless he had been *furiosus*, *fatuus*, *et naturaliter idiota*, and for the tact and caution of his evidence, which forms a striking contrast to the rashness of some of the medical witnesses on the same side of the question, we cannot help remarking that he ought to have taken measures to ascertain more clearly the state of the defender's mind. His evidence by no means shows that David Yoolow was not imbecile; and we do not think that he was justified in saying that his powers of comparison are good, and that he has all the capability of acquiring knowledge. Let us examine, however, his statements a little more minutely.

In testing Yoolow's powers of comparison, the witness put questions to him regarding the nature of the Apocrypha compared with that of the Old and New Testaments, "the relative punishments likely to follow according to the knowledge of good and evil, and in regard to money matters." Now, what was the amount of information which he possessed on these subjects? He knew the use of a receipt, that he would be a loser if he destroyed a bank note, the consequence if he became cautioner for the payment of any sum, and he would not read the Apocrypha, because, as was suggested to him by the witness, it was doubtful whether it was inspired, which he knew the Old and New Testament to be. Although he acknowledged that subscribing to missions was the way of extending Christianity over the heathen world, and that that was a proper object, he would only *perhaps* subscribe if he had anything to spare. Add to this, that Yoolow knew he would be cheating if he sold grain at a certain price on sample, and substituted an inferior article for it; that, if two things differing in value were exchanged, the difference must be made up; that he could tell the hour on different watches; that he could explain the difference between home-made stockings and those bought in the shops; and that he seemed to understand perfectly the difference between faith and good works; and we have all the proofs stated by Dr Robertson of his capacity. It is said, also, that he solved some questions in addition and subtraction proposed to him at random, but, as no example is given, we cannot ascertain the amount of capacity which this indicated. Dr Robertson acknowledges that he had no opportunity of judging whether Yoolow was a man of firm mind or purpose, or could be easily imposed on or not, and therefore he very wisely declined giving any opinion on the subject.

---

[*] The other persons present were Yoolow's agent, and Mr Bell, whose evidence we shall have occasion to examine immediately.

All that is proved by Dr Robertson's evidence is, that Yoolow was not an absolute idiot. It does not, however, show that he was capable of acting for himself. We consider the facts admitted by him, that Yoolow started no subject of conversation; that he was decrepit in his hands and limbs; that the movements of his limbs were irregular and frequent, to be corroborative of the facts and opinions stated by the witnesses for the pursuer; for it must be kept in mind that the defender's affection was owing to paralysis consequent upon a severe fall on the ice during childhood. His opinion, that the defender is capable of improvement, because he has mastered those subjects to which he has attended, rests on rather a slippery foundation. What, we ask, are the subjects which he has mastered? He has a knowledge of the Scriptures and the doctrines of the Church; but all his other information might be acquired in an hour or two by a child of ten years of age. Now, Dr Robertson must be aware that there are insane individuals who have a minute knowledge of a particular subject, and are yet incapable of mastering any other. This seems to be Yoolow's case. The difference between *intensity* and *extensity* of intellect, the witness seems to have overlooked. The mind which is greatly deficient in either is decidedly unsound, or at least feeble and imbecile; and the possessor of such a mind is not only incapable of acting for himself, but he is liable to be influenced by others to his own detriment.

The next witnesses were Mr Bell, surgeon, and Dr Nimmo, physician, both in Dundee. The former had been nearly thirty years in practice, and the latter is physician to the Dundee Lunatic Asylum, and had been thirty-seven years in practice. The report, drawn up on soul and conscience, presents us with a conclusion so extraordinary that we must give it in their own words. We shall omit the first portion, as it contains a mixture of facts and conjectures relating to subjects on which we have already laid positive evidence before the reader. The remainder runs as follows.

"As he grew up, he became very religious, and employed much of his time in prayer and reading the Scriptures, with which he is most familiarly acquainted, so that we found, when his servant read to him, he readily checked any omission or misnomer that she made, and at once told us the book and chapter which she was reading, although these had been promiscuously turned up. He also explained distinctly what he read himself. At the same time we learned that he was in the practice of teaching the younger servants to read; and the one present said, that she was much improved by his instructions.

" The questions put to him regarding his relations, the value of different coins, and his knowledge in various matters, were answered in a manner beyond what could have been expected from one whose opportunities of acquiring information have been so very limited.

" We therefore have no hesitation in declaring it as our most decided opinion, that David Yoolow is neither an idiot, fatuous, or [nor] *non compos mentis, but, on the contrary, that he possesses a strong, though uncultivated mind,** and is therefore perfectly competent to select proper persons to manage his affairs, or to bequeath his property. All which we declare on soul and conscience. (Signed) PATRICK NIMMO, M. D. ALEXANDER BELL, F. R. C. S. London.—*Dundee, 26th January* 1837."—Pp. 32, 33.

We doubt not, the reader will be as much astonished on reading the preceding document as we were. Of all the absurd certificates and declarations which it has been our misfortune to peruse, and we have seen not a few, this is the most extraordinary. According to this, David Yoolow, who can scarcely articulate distinctly, is teaching others to read. The man who has been represented as idiotically superstitious, as " pleased with a rattle, tickled with a straw," admiring brass buttons, amusing himself with indecencies and *grosing*, ignorant of all matters connected with the speculation in which his money is embarked, and under the control of his servants, is not only not an idiot, is not only not imbecile, but possessed of a strong though uncultivated mind, and, what is more, notwithstanding the uncultivated state of his mind, capable of instructing others! The grounds of this extraordinary opinion will presently appear, and then we shall leave both of the gentlemen who gave it, in rather an awkward dilemma.

Mr Bell was first examined, and, after reading the document from which we have made the extract above, he declared that he had visited Yoolow the same morning, and that, from what he observed, his opinion was confirmed. According to him, Yoolow has a distinct notion of the relations of time, he can count on progressively to twenty very well, he was not asked to do more, but he knew that 21s. made a guinea.

" He was asked," says Mr Bell " about his money in the bank in my presence, on the first occasion; and L. 1200 was spoken of as the amount of his money. He was asked to take L. 500 from it, and to say what remained. He at once said L. 700; but whether this was asked by Mr Kerr or Dr Nimmo I cannot tell.† Dr Nimmo asked him, if he was to get L. 1150 for his L. 1200, would that satisfy him? He answered, 'Na, I would like the whole sum. Would you,' (meaning Dr Nimmo) 'take that sum?' He was asked how much more he would require to make up his L. 1200? He at once said, L. 50. He was asked the value of ten quarters of oats at L. 1, 10s. a quarter? He answered ten times thirty is three hundred—that is fifteen pounds. That question, I think, was asked by Dr Nimmo, Mr Kerr did not take a lead in the questioning."—P. 33.

---

* The italics are ours.

† This is a most important circumstance. Mr Kerr was Yoolow's agent. From other witnesses it would appear that Yoolow must have felt considerable difficulty in answering this question. That Yoolow had been tutored on some other points, there can be no doubt.

After stating some more facts respecting reading and understanding the Bible, Mr Bell concludes his evidence by saying, that there was no answer given by him that indicated a wandering of the mind, but quite the contrary.

In his cross-examination he admitted that he had not turned his mind much to the subject of insanity, though he had seen a good deal of it, the truth of the first part of which statement is amply proved by his declaration, which we have already quoted, as well as by what follows.

"Is an acquaintance with the Scriptures inconsistent with being of unsound mind? A person who could converse and give opinions, such as David Yoolow did, must be possessed of judgment as well as memory. I think it possible that a great memory and knowledge of chapter and verse may not be inconsistent with an unsound mind. I do not at present recollect of any case of that description, nor do I recollect of having read of any such. * * I thought him a nan of a strong mind, from the ready answers he made to the quesions put to him. From the situation in which the man was placed, nd from his bodily infirmities and uncultivated mind, he was naurally led to look for assistance from others. He is of a timid and asily excitable temperament, from the nature of his bodily ailnents. From what I saw of him, I think that where his interest vas concerned, he is a man not likely to be easily imposed upon, nd who would resist where he saw any thing improper. I think e possesses a good deal of caution, and attends to his own interest. rom the nature of his complaints he could not look actively after is own affairs, being unable to go abroad. He showed a knowledge f money transactions, but I do not think that he could overhaul counts, as he had not a knowledge of arithmetic, and entrusted is affairs to others.—As he intrusted his affairs to others, and uld not overhaul accounts, in what respect did he show caution regard to his own interest? He seemed to have confidence in the aracter of those who had the management of his affairs, and into hose character he seemed to have inquired? Did he inquire at u the character of any of those who managed his own affairs? e did not. How do you know that he inquired. He seemed to ve confidence and expressed himself satisfied. In what respect d his expression of confidence seem to indicate caution in the magement of his affairs. I think that question has been put and anered already. I do not know whether he can read manuscript, t he read a bank note. From the state of his hands, it is imposle he could write."—P. 34.

We suspect that Mr Bell's opinion, that David Yoolow possesses a strong though uncultivated mind, rests on no better foundation than his statement, that the defender had inquired into the character of those who managed his affairs.

Dr Nimmo's evidence in chief is to the same effect as Mr Bell's, and his cross-examination affords a pretty satisfactory refutation of his opinions. He had been physician to the asylum for only two years, and had paid, he stated, some little attention to insanity. We cannot spare space for a detail of the cross-examination, which reflects upon him so little credit, and throws no light upon the investigation.

The next witness was Dr Carruthers, physician in Dundee. He graduated about seven years before the trial of this action. He assisted the late Dr Ramsay in organizing the Dundee Asylum, and classified the patients under his direction. He had visited the asylum at Perth, and Dr Smith's at Newcastle. He had spent a month in Paris, and had several times visited Esquirol's establishment, as well as the hospitals Bicêtre and Salpêtriére. Esquirol, is, in his opinion, the highest living authority on diseases of the mind. This witness considered religion to be one of the best subjects for testing whether a person be an idiot or not. * After detailing several circumstances, which do not in the slightest degree alter the opinion which we have already expressed, he sums up in the following manner.

> "I think he has a sound and reflecting mind, a capacity to receive information, and the capability of applying the information which he receives. The range of his information is greater than I should have expected in a person so long secluded from society. He is capable of improvement, of acquiring farther information, and of applying it. I found my opinion upon this, that his faculties are sharpened, and his mind improved since I first saw him upon the 8th of this month. In the course of the conversations I had with him, he said nothing that indicated either insanity or idiocy. In all my examinations at the hospitals I have mentioned, I never found a person with such a mind, under restraint as an idiot or insane person."—Pp. 39.

On cross-examination, Dr Carruthers stated, that he was surprised to find Yoolow so little excitable on particular occasions, as when examined on questions such as, how many pence are in a sixpence, twice one is two, twice two is four. When these questions were put he was quite calm. This, we think, is easily explained. He was as happy to have an opportunity of showing his knowledge on this subject, as he was to let Dr Christison see that he knew who was King. Be this as it may, the fact shows him to have been a weak-minded man.

---

* Was Smart, the poet, mad or not when he composed and wrote his "David," on the walls of his cell; and are those individuals whom he must have seen in the Perth Asylum, and who are said by Dr Malcolm to possess an extraordinary knowledge of the Scriptures, unjustly deprived of their liberty?

The substance of the deposition of the next four witnesses was, that Yoolow when at school was as clever as other boys; that there was then nothing wrong about him; that he is not an idiot in any way, but the reverse, being of sound mind; that he never talked irrationally on any subject; and that he had a perfect sense of propriety, honesty, and fair dealing.

The last witnesses called were Mr Lowe, surgeon, Coupar Angus, and Mr Halkett, surgeon, Perth. The evidence of the former it is necessary we should quote at length, as we shall have some remarks to offer on it, and we are anxious that the witness should be allowed to speak for himself.

" I have been a surgeon for about thirty-six years, and have practised in this place for about thirty years. I attended the late Miss Yoolow about nine months ago, and I had an opportunity of seeing David Yoolow frequently. I have directed my attention to ascertain the soundness or unsoundness of his mind. The result of my experience is, that he is of a sufficient degree of soundness of mind to give direction to others to act for him; from his decrepitude of body he is unable to act for himself. I have conversed very little with him upon subjects of religion. But I have conversed with him upon practical subjects. He informed me he had never been taught arithmetic. I have put questions to him as to the value of sums and numbers. Upon the 15th day of January, I took a note of some things that passed, which I shall read: they were as follows: Q. ' How many shillings does it take to make a pound Sterling?' *A.* ' Twenty.' Q. ' Suppose beef at 6d. per pound, how many pounds of it would a pound Sterling buy?' *A.* ' Twa twanties, forty.' Q. ' What proportion of a year is a week?' *A.* (after some calcula- ' tion) There are 52 weeks in a year, 365 days, and 366 in leap year.' Q. ' What proportion of a year is a month?' *A.* ' Twelfth. Q. ' Whether are two-thirds or three-fifths of any thing the greater proportion of it?' Could not get him to answer farther than that any thing divided into a greater number, each part was less than when divided into three. Q. ' Suppose you receive 30s. for a quarter of barley, how much should you expeet for five quarters?' ' *A.* L. 6 and 30s.; L. 7, 10s.'; after calculating and considering for a considerable time. Q. ' Whether do you consider L. 5000, or fifteen hundred pounds the greater sum?' The ' fifteen hundred' evidently struck him forcibly at first; but, upon a little consideration he corrected himself, and said that if he had to receive the sum, he would prefer the L. 5000. Q. ' How many pounds are there in a hundred weight?' *A.* ' I cannot tell, I have no arithmetic.' Q. ' Which is the largest of the two—a pound, or a hundred weight?' *A.* ' A hundred weight ' Q. ' In which month of the year is the term of Lammas?' *A.* ' In August.' Q. ' Which day of that month is it on?' *A.* ' The second.' Q. ' What do you consider the difference between honesty and dishonesty?' *A.* ' The difference between an honest man and a thief.' Q. ' If a man was to sell you oats said to be similar to a parcel shown you, and to deliver grain of a quality different from that sample, what would you consider that man's conduct to be?' *A.* 'Dishonest and deceiving me.' Q. 'Can you tell me how many stones of fourteen pounds to the stone, it takes to make a hundred weight?' *A.* 'I am not used to count by stones.' I found he had been bargaining about a cow he wished to sell, for which he wanted L. 14, and had been offered 11½ bolls of oatmeal; upon which I proposed the following questions to him. Q. 'What is the price of a boll of oatmeal?' *A.* '22s.' Q. 'How much money does 11½ bolls meal amount to at that price?' *A.* 'L. 11, 10s. and 23s.' Q. 'Then what was the difference between what you wanted for the cow, and what you was offered?' *A.* '20s. and 7s.' Q. 'Suppose you had got the sum you wanted for her, how much luck-penny would you give?' *A.* 'Maybe five shillings.' Q. 'What money would you put in your pocket then?' *A.* 'L. 13, 15s.' In reference to this question regarding the cow, I have to explain that I had been asking him what he had been doing since I last saw him, when the maid said he had been trying to sell a cow; and it was from himself that I learned he had been asking L. 14, and that he was offered 11½ bolls of oatmeal. I have seen him twice since then, and I am very much disposed to think he has shown more capacity of acquirement, which I ascribe to his having more frequent intercourse with individuals. I do not consider him an idiot.

" Cross-examined by Mr Robertson:—There was no other person present but the servant on the 5th of January; but before I left the room Charles Scott came in, apparently dressed for the market, and he asked David if he had any more messages. David said he had not, but to be sure not to sell the cow under L. 14. The questions I put were entirely of my own suggesting. When the question was put to him whether he would have L. 1500 or L. 5000? he was evidently struck at first with the words 'fifteen hundred,' and repeated them as talking to himself; but, after a little consideration he corrected himself, and said he would prefer the L. 5000. He sometimes looked to the maid, as if appealing to her whether his answers to the questions were correct; but there was not the least interference on her part. I never saw him excited. Upon some of the occasions I saw him, I had conversations with him as to the value and extent of his farm. He considered the farm as his own, and he knew that he had more than one farm; and I know that there are more farms than one that belonged to his late sister."—Pp. 42–43.

The first part of Mr Lowe's evidence in chief seems rather to establish the imbecility of David Yeolow's mind. The questions, which were simple, and involved those facts which he could acquire by rote, he answered. He was even capable of ascertaining that, as sixpence is the half of a shilling, there must be twice as many sixpences as shillings in the pound, and that this was the process by which he was enabled to solve the question, how many pounds of beef at sixpence per pound could be purchased for one pound Sterling, is obvious from the answer which he made, " Twa twanties, forty." Several of the other questions which follow show that he had a very confused notion of the value of numbers, especially when he hesitated whether he would take L. 1500 or L. 5000. The 15 compared with 5 evidently puzzled him, but when he reflected that the one was hundreds and the other thousands, he seemed to prefer the highest denomination. This shows him to possess a small amount of the comparing faculty, though sufficient to prove him not to have been an idiot.

The last part of Mr Lowe's evidence appears to show that David Yoolow possessed considerable powers of calculation. But this is inconsistent with the facts stated in the first part. The questions respecting the cow, to be sure, were by no means abstruse or even difficult; yet, even though we were to adopt the opinion, that Yoolow had a mind of average strength, we would have to reconcile it with what occurred on other occasions. There seems to us but one way of accounting for the matter, and that is to suppose, what is exceedingly probable, that the whole matter had been discussed with David Yoolow before the witness appeared, and that by means of addition and subtraction he had been made to comprehend the matter.

We come now to the evidence of the last witness, Mr Halkett, surgeon, Perth. We quote those portions only which contain additional facts. After mentioning the circumstances under which he visited Yoolow, and stating facts which proved him to possess a good memory, he thus proceeds :—

" I also asked him about weights, and prices, and fat cattle. In his answer to one of the questions, he referred to the Bible. One question I put to him was, if he fed cattle on his farm? He said he did. I replied that if he made them fat, he would get good prices for them this season. He said he liked good prices, and that he thought good prices were best for the country; but, he added, he would not like the 'shekel without the ephah.' I did not at first understand what he meant by the ephah, and he said 'You will learn what I mean from a chapter in Amos. You will find it in Amos, the eighth chapter, and fifth and sixth verses.' After I went home, I turned up the Bible, and found the passage quite applicable :—His idea being that he would not like the price without the value. I asked him about the weight of meal. I asked him the weight of a boll of meal. He instantly said 'There is no such thing as *bolls* now, but *sacks*;' and I asked him the weight of a sack. He told me '280 pounds.' 'I did not myself know this.' Neither did a meal dealer in Perth without calculation. 'I asked David Yoolow how many pecks of meal would be produced from a boll of oats, to which he replied, that 'all oats were not of the same quality.' I then asked what ordinary oats would produce in meal? On this he turned to the maid, but she said nothing; and he then said 'I'm thinking sixteen pecks.' I think his mind is improved since I first saw him, which I ascribe to increased intercourse with others of late. I conceive him capable of receiving information, and using it. I consider him sane, and not an idiot, or fatuous."—Pp. 44, 45.

From the cross-examination of this witness, it would appear that Yoolow was ignorant of the terms of his sister's settlement. Upon the whole, Mr Halkett's evidence shows that Yoolow was not an idiot in the strict sense of the word, but does not prove that he was not imbecile. It shows him to have been possessed of memory, and the improvement of which he speaks, seems to have been nothing more than the acquirement of some new facts, with which, for all we know, he might have been crammed for the occasion.

After the counsel on both sides had addressed the jury, and the Sheriff had summed up, the jury found a verdict of *not proven.* In the propriety of this verdict we entirely acquiesce, because, unless Yoolow had been in a state of total idiocy, it was impossible for them to have found the heads of the brieve and claim proven.

We have now given a very full view of the evidence. To prevent misrepresentation, we have stated it as far as possible in the words of the witnesses, and have commented on it as we proceeded. We intended to have concluded this article with some observations on the various degrees of imbecility, and to have applied our doctrines to the case before us. Our space, however, is already exhausted, and we must content ourselves with briefly announcing our opinion of David Yoolow's intellect.

From a careful review of the whole evidence, the conclusion is irresistibly forced upon us, that David Yoolow is of imbecile mind, and incapable of managing his affairs. This opinion is founded on the following facts; 1. his paralysis being the result of a severe fall on the ice, which must have injured his brain; 2. the imbecility of his appearance, habits, conversation, and amusements; 3. his devotion to one subject to the exclusion of every other, and his total indifference to all matters connected with his interests, as shown by his being ignorant of the terms of his sister's settlement, and of L. 960 being taken out of the house; 4. his being under the control of others whom he ought to have controlled; 5. his absurd and wandering questions, repeated without any regard to their being answered; his predilection for white cattle and dogs, his dislike to certain individuals, and his terror for others, lest they should by some supernatural means injure him, for this is the only way in which we can interpret his assertion, that certain individuals were not *canny*, and his anxiety to learn whether others were so; 6. his inability to originate any subject of conversation except what a child of six or seven years of age would originate; 7. the opinion entertained of him by his parents, his sister, and the servants, as well as his ordinary medical attendant. In corroboration of the correctness of this view we might cite further, the declarations of all the medical witnesses who had really made insanity the object of study. Two medical men, who had some opportunities of studying insanity, are no doubt against us. But the one, though he is physician to the Dundee Asylum, shows, in his cross-examination, that he has paid little attention to the subject, and the other, though he has visited five asylums, and classified patients in a sixth, under the direction of another physician, furnishes us with a pretty fair criterion of his information on medico-legal points connected with insanity, when he says that he considers religion one of the best subjects for testing whether a person be an idiot or not.

The mind of David Yoolow, though not fatuous, is deficient both in *extensity* and *intensity*,* and, therefore, his relatives should have applied to the Supreme Court either for interdiction, or for the appointment of a *curator bonis*. The form of action adopted was quite inapplicable to his case, and we are surprised that it was had recourse to. David Yoolow requires protection, and the sooner that is procured for him, the better.

We cannot conclude without remarking, that Mr Colquhoun deserves the thanks of the profession for the very excellent report which he has given of the case, and for his compendious view of the law applicable to it.

ART. III.—*Traité des Fièvres, ou Irritations Cérébro-Spinales intermittentes, d'après des observations recueillies en France, en Corse, et en Afrique.* Par F. C. MAILLOT, D. M. Ancien Medecin des Hôpitaux Militaires D'Ajaccio et D'Alger, ex Medecin en Chef de l'Hôpital Militaire de Bona. 8vo. Pp. 420. Paris, Bailliere, 1836.

Treatise on Fevers, or Intermittent Cerebro-Spinal Irritations; from observations made in France, Corsica, and Africa. By F. C. MAILLOT.

THE important official situations which the author of this work occupied in the French armies, opened to him a very extensive field of professional observation and experience, of which, as far as intermittent fever is concerned, he gives us the result in the present treatise. M. Maillot's principal aim seems to be the establishment of certain pathological opinions relative to the nature of intermittents; and though his object may not, in this respect, have been fully accomplished, our readers may be interested in having the opportunity of becoming acquainted with some of the views, and deductions of an attentive, zealous, and correct observer, on a very important class of diseases, occurring more particularly in Africa, and in that part of it which is occupied by the French armies.

According to the author's experience, tertians do not constitute the most usual form of intermittent fevers. Among 3114 cases which he saw in Africa, 2181 were of the quotidian type; 901 were tertians; and 32 quartans;[*] while of 386 cases which occurred to M. Nepple in France, 198 were quotidians, 115 tertians, and 59 quartans.[†] With regard to the period of attack, his tables evince, that two-thirds of the whole number had their access between midnight and noon, of which 326 occurred at ten in the morning; and 363 before six. The seasons seemed to have little influence on the period.

---

* Vide Edinburgh Medical and Surgical Journal, Vol. xlviii. p. 191.

Intermittent fevers the author divides into ***Intermittents***, ***Remittents***, and ***Pseudo-continued***, by which last he implies such as have neither an apyrexy nor apparent paroxysms, and which only evince their nature by the occasional exhibition of phenomena which belong exclusively to intermittents. He considers these divisions as constituting three degrees of the same affection, having its origin in *cerebro-spinal irritation*, and varying in severity according as the irritation may be great, or small. The thoracic or abdominal inflammation, with which intermittents are sometimes blended, he views as secondary occurrences or complications; and not as indicative of any augmented severity of the original disease; but *cephalalgia*, *coma*, and *delirium*, he regards as dependent on irritation of the *encephalon*, the same original pathological state to which he regards the simple intermittent as owing its existence. When simple intermittents become dangerous or pernicious, (*Febres perniciosæ,*) and terminate fatally, without having exhibited any other sets of phenomena than are referable to the nervous centres, deep-seated cerebral congestion, he tells us, is invariably discovered after death, with only a slight affection of the gastro-intestinal mucous membrane. But when to the intermittent has been united gastric or enteritic inflammation, there is not only the same degree of injection of the cerebro-spinal axis discovered after death, but also such an increase in the pointed redness of the abdominal mucous membrane, as is considered by the author to be the unequivocal effect of very active excitement. The following is his summary of the evidence on which he founds his conclusion as to the seat of intermittents.

" Whatever may be the precise form of the severe intermittent, we have always discovered," says the author, " a congestion, more or less strong, of the cerebro-spinal axis, or its envelope. By an analysis of the symptoms, it is easy to follow the different degrees of irritation in the great nervous centres, from the most profound coma,

---

[*]

At Bona.		*At Algiers.*		*Total.*	
1582	+	599	=	2181	Quotidians.
730	+	171	=	901	Tertians.
26	+	6	=	32	Quartans.
2338	+	776	=	3114	Total of all kinds.

[†] There is here a mistake either in the total number or its integral parts. But we merely mention the fact.—EDITOR.

to the slightest headach. But pathological anatomy cannot make known the alterations proper to small degrees of this morbid state, because the latter are never mortal; and such alterations are only matters of inference. Would it be going too far, therefore, to conclude," he adds, "that the cerebro-spinal congestion, which is so well-marked in persons who have sunk under an attack of *coma, delirium,* or rigor, and is so much less in fevers where there has been only severe headach, goes on decreasing, with the symptoms by which it was characterized, and at length exists only, in the slightest degree, in cases where there were no other indications of disease, than chillness and weight in the head? The fact may not, perhaps, for a long time, be directly demonstrated, but it appears exceedingly probable."

Remittent fevers are considered by the author as nothing more than intermittents, in which the reaction has gone beyond the regular duration of the paroxysm, by the accidental prolongation of some species of irritation. Hence he regards it as by no means difficult, in examining the different varieties of remittents, "to separate what is fundamental from what is accessory; and to recognize what belongs to the intermittent, and what to the continued form of fever." At the same time, however, he admits the great difference which exists between the ordinary characters of remittents in temperate and warm climates, and gives a long and apposite quotation from Lind on the subject.

Pseudo-continued fevers, though comprehended by the author in the class of intermittents, exhibit, from their commencement, he tells us, a continued form. The intermissions and remissions are entirely concealed by the high degree of vascular reaction; and this reaction, as in the case of remittents, is produced by the permanence of the irritation which gives rise to, or is connected with, the original attack. "When left to themselves, or treated by antiphlogistics only, they sometimes, after a few days continuance, assume the remittent or intermittent character, sometimes they become typhoid; (and it is to this latter fatal degeneracy, that we must refer all that has been written on putrid, nervous, malignant, and pestilential fevers of warm marshy countries;) and sometimes they unveil their nature by the sudden appearance of phenomena which belong to severe intermittents, to wit, delirium, coma, &c. which come on in an instant, and to a great extent, and not gradually, as in continued fevers." Secondary inflammatory affections of the *primæ viæ,* when united with intermittents in summer, withdraw entirely the intermittent character, and communicate a continued form.

In treating such combinations, bleeding and other antiphlogistic means are to be combined with the remedies necessary for preventing the return of the febrile paroxysms.

Sudden and great vicissitudes in the weather, particularly when aided by irregularities in diet or regimen, or by passions of the mind, are the most frequent causes of intermittents, in regions which are not marshy; but no progress has been made in detecting, by the nicest tests of modern chemistry, any sort of difference between the air, or the condensed vapour of the most noxious marshes, and those of the healthiest uplands, though in the one 50 years is the utmost duration of life, much of which is connected with delicate health or absolute suffering; while in the other, the inhabitants may reach 90 or even 100 years, with almost uniform strength and vigour. It is observed, however, that in the middle of the day, when the exhalations are most considerable, there is less liability to be affected by them than after sunset, when the author considers it as a reasonable supposition, "that the vapours, condensed by the coldness of the earth, fall by means of their weight, and are absorbed by all the surfaces with which they come into contact; as the lungs, the skin, and the alimentary canal, at the instant when, being in small volume, they contain a large quantity of their deleterious principles." The nights, too, are very cold in marshy situations during the summer; and in Africa, where the thermometer rose to 86° of Fahrenheit in the shade, (30° of the Centigrade,) during the day, it fell at night to 64°; and at St Florent in Corsica, it is found necessary even in the months of August and September, to have fires in the evening. M. Maillot did not, however, find that in the encampment at Bona in Africa, in 1834, much advantage was produced by a similar practice; but the inhabitants avoid going out, or working in the fields, after sunset. Some remarkable instances occurred in Corsica, of the occasional appearance of intermittents in salubrious situations, when marshy exhalations were conveyed to them over a considerable extent of country by particular winds.

The average mortality at Bona in the three years extending from April 1832, to March 1835, was 1 in 9, or 2513 deaths in 22,330 admissions; but the natives are much less liable to attacks of the disease, and suffer less severely from it. In 28 cases are given the morbid appearances which presented themselves after death; and in all of them, according to the summary of the author, an injection, more or less vivid, and always of a vermilion red, was found either in the substance, or in the membranes, but generally in both of the great nervous centres, that is, the brain, *cerebellum*, and spinal marrow. The substance of the *cerebellum*, and of the spinal marrow, was not, however, so uniformly affected as that of the cerebrum itself. In the mucous membranes of the stomach and intestines, marks of florid injection were usually found, together with softening and discoloration of various characters; but as they were not constant, the author considered these appearances either as indicative of affections of some standing, or as accidental and secondary. He does not consider vascularity, even when florid, as a proof of active inflammation; and, therefore, he carefully avoids terming it more than congestion or fulness, but he regards it as evincing a "nascent irritation," differing much from the fixed characters of inflammation. In the estimate which the author forms of the nature of the appearances in the encephalon, which he mentions as being continually connected with intermittents, there is much liability to be deceived, by the altered state of vessels which occurs at the close of life or after death; a circumstance which does not seem to have been sufficiently attended to by him. In the lax mucous membrane too, of the intestinal canal, there does not seem to have been a sufficient appreciation of the extent to which the general character of the disease, and the nature of the climate, may operate in producing the appearances of venous congestion in the smaller vessels. In examining the varying opinions of authors relative to the precise nature of intermittent fevers, he considers the deductions to be made from symptoms on the one hand, and appearances exhibited by dissection on the other, as the only safe guides, and as very nearly leading to a correct conclusion on the subject; and those as centering, constantly and invariably, in affections of the cerebro-spinal axis. The early symptoms of the disease, particularly the pain of the back and weakness of the lower extremities, he considers as decisive proofs of an affection of the spinal marrow. To the same cause he ascribes the chilliness and shaking, and the defect of power in the movements of the heart, which organ seems to be spasmodically affected, and unable to project the blood into the arteries with the usual force, whence an accumulation takes place in the centre of the body. Though some of these symptoms may present themselves at the commencement of other complaints, and particularly the *phlegmasiæ*, yet he thinks there is no sufficient analogy to affect his reasoning, or to do more than exhibit some evanescent sympathies with the nervous centres under such circumstances.

The cerebro-spinal centre, he is of opinion, operates alone in producing the reaction which takes place in the vascular system generally, soon after the cold stage of the complaint; and tends to the hot and sweating; and, according to the severity and peculiarities of the cases, give rise to the various other phenomena by which diversities in form and danger are constituted.

The ultimate cause of these phenomena, is, according to the author "an irritation," which has its anatomical character in a congestion or "hyperemia of the nervous matter and its envelopes," "une irritation qui a pour caractère anatomique, une hypérémie de la matière nerveuse, et de ses envelopes." This congestion, however, must be of an active nature, where delirium or coma occur; and hence he does not agree with those who regard such incidents, (though we admit the unsatisfactory and useless nature of such sort of speculations,) as indicating asthenia of the brain. But there is much analogy between the appearances which present themselves when delirium has been the essential character or coma;

though he is inclined to believe, that congestion in the gray substance of the brain is the leading characteristic when delirium predominates; and in the medullary, where coma principally prevails; and when both take place, that the hyperemy has been general over the whole encephalon. On the other hand, when chilliness and the depression of powers connected with it, have been the leading characteristics, forms which he terms, in imitation of Werlhof and Torti, "fièvre algide," the spinal marrow has been most the seat of disease. The author owns himself unable to account for chilliness, (algidité,) not having occurred in subjects when softening of the *medulla spinalis* might have rendered it likely to occur; but he is reconciled to an occasional exception, by a consideration which he candidly admits, and which shows with what caution general deductions are to be made in morbid anatomy; namely, that in cases when there were neither delirium nor coma during life, dissection sometimes exhibits the brain and its membranes in a state of congestion.

In the adoption and exposition of this hypothesis, M. Maillot, it will be perceived, is not original. The same doctrine had been first proposed by Darwin and Broussais, and some of his pupils, in order to explain the phenomena and varieties of intermittent fever; and it has since that period found a most zealous advocate in M. Mongellaz, who has given a view of intermittent and remittent fevers, chiefly founded on the principle of irritative motions subsisting in the system, and evincing their effects at certain periods, and in definite modes.

With regard to the treatment of intermittents, as soon as the first stage of the disease is over, and reaction commenced, the author deems it proper, if the patient be young and strong, to bleed to the extent of from twelve to fifteen ounces, and if any symptoms of local determination are present, to apply leeches very freely to the amount of 30, 40, or more. To prevent the recurrence of the paroxysm, he considers the free employment of the sulphate of quinine as the best remedy; but is of opinion, that in France there is too much reserve in using it; and that if, instead of giving from four to eight grains only in the interval of the paroxysm, beginning eight or ten hours before its return, from twelve to twenty grains in four ounces of water are given at once, about four or five hours before the paroxysm is expected, the accession of the fit will very commonly be prevented, and that without the production of any inconvenience to the stomach or bowels. He considers it as unnecessary to give the quinine more than a day or two after the cessation of the paroxysm.

When the complaint returns, a similar treatment is necessary, with a more sparing use of general blood-letting, and a freer employment of leeches and quinine; but when repeated returns take place, a change of residence becomes absolutely necessary for the restoration of health.

In the intermittents of warm climates, at all periods of the year, and in those of temperate climates during summer, more active and vigorous means are necessary to prevent them assuming a continued type, and taking a dangerous form; and these consist in the more prompt and liberal use of the same remedies which are required for ordinary intermittents. When a patient is seen for the first time during the state of *apyrexy*, or during a period of reaction, a bleeding of fifteen ounces is immediately necessary, with a liberal application of leeches to the abdomen, if there should be any thing like irritation in the intestinal canal; but should there have been much headach in the access, and this should continue, or if the intestines or lungs should be the seat of congestion, a bleeding to twenty-five or thirty ounces is immediately necessary, followed by large and repeated application of leeches. In summer, however, the general blood-letting should be less considerable, and the local bleeding larger in consequence. But the instant that the bleeding has been performed, and sometimes even previously, recourse must be had to quinine, in doses of from twenty-four to forty grains, in a few ounces of water, without reference to the state of the symptoms, the continuance of vascular action, or the indications of gastro-enteritis. The sulphate of quinine may be administered by enema, when the symptoms of *gastritis* are considerable; but the author has never found any difficulty in giving it by the mouth, under any circumstances. He gives many cases of a very severe character in exemplification of the plan which he recommends; and, as a proof of its efficiency, he states, that at Bona, in 1832, the deaths were 449 out of 3132, or 1 in 7; in 1833, 1526 out of 5299, or 1 in 3½; but in 1834, only 538 out of 11,181, or 1 in 20.

In noticing this work, we think it is possible to discover indications of a more beneficial theory of the therapeutics of intermittents, than we can find in the majority of the French works on the same subject. The treatise of Senac, and the more recent performances of Alibert, Coutanceau, Monfalcon, Mongellaz, Bailly, and Bouillaud, are valuable, in various respects, in endeavouring to illustrate the nature of the disease, its varieties, its larvated or masked forms, its complications and its terminations. What we most wish, however, to see, is a correct appreciation of the symptoms of the several forms of pernicious or masked intermittent, as means of forming correct and useful therapeutic indications. In this we conceive there are two extremes to be avoided. The one is, that, as intermittents, in their masked and pernicious forms, are liable to give rise to congestive and inflammatory symptoms within the organs of the head, chest, and abdomen, simulating in all respects idiopathic inflammation of these parts, the practitioner must, on the one hand, subdue these symptoms by adequate and prompt depletion; but as all these symptoms arise from miasmatic sources and partake of the intermittent, periodic, or recurrent and remittent characters, he must also administer, on the other hand, and without delay, the sulphate of quinine as an anti-periodic remedy. In short, unless the practitioner bear in mind this twofold character of these disorders, he is in danger of trusting too much to either mode of treatment to the exclusion of the other, whereas both ought to be combined. By thus uniting their conjoined effects, he renders less evacuation necessary, and he does not aggravate the local congestions in inflammatory attacks by the exclusive use of sulphate of quinine.

Though M. Maillot does not explicitly in any part of his work give this view, his observations lead to it by implication. We should have had pleasure in observing that he had given the doctrine a stable and permanent basis, and invested it with that importance in therapeutics to which we think it is justly entitled.

We give the following case as an example of the mode of treatment adopted by the author.

Muller, a soldier of the Third Chasseurs, of 22 years of age, strong and well-made, had been ill a month previously, but was readmitted on January 15, 1835, about noon. He was in a state of profound coma, and totally insensible, with a pulse full and large, but without hardness; temperature little above the natural; respiration deep, and the appearance that of a man asleep. Fifteen ounces of blood were drawn from the arm, and thirty leeches were applied to the neighbourhood of the jugular veins; forty grains of sulphate of quinine were administered, and sixty grains thrown in by the rectum. A blister was applied to each thigh, and a sinapism to each leg. At eight in the evening the coma continued unabated; the insensibility rather less; the skin rather warmer. Eight or ten ounces of blood were taken from the temporal artery; forty grains of sulphate of quinine were directed to be administered at twice in the space of two hours, and cold fomentations applied to the head.

On the following morning the tongue was coated, the epigastric region tender, more sensibility, some perspiration in the night: forty grains of sulphate of quinine administered, a cataplasm to the epigastrium, and the cold fomentations continued. Apyrexy was complete during the day, and in the evening the patient was in the most satisfactory state.

On the 17th, every thing was favourable. He took twenty-four grains of sulphate of quinine, and had an emollient enema.

On the 18th he was convalescent, and took some milk. On the 27th he was put on middle diet, but, from deviations in regimen, was kept back, and had, early in February, a return of his complaints from which, however, he recovered.

Before he came into the hospital, he had five paroxysms of fever, which came on daily about three o'clock in the morning.

ART. IV.—*A Treatise on the Diseases and Injuries of the Larynx and Trachea ; founded on the Essay to which was adjudged the Jacksonian Prize for* 1835. By FREDERICK RYLAND, Surgeon to the Town Infirmary, Birmingham. 8vo. London, 1837. Pp. vii. and 338. Six Plates.

MR RYLAND's treatise furnishes us with a digest of the information contained in various papers and treatises on isolated affections of the *larynx* and *trachea*, together with the results of his own experience. It consists of three portions, the first comprehending an accurate and condensed view of the anatomy, physiology, and pathology of these organs; the second, an account of their diseases; and the third, an account of the injuries to which they are liable.

It is not our intention to examine in detail the subjects discussed by the author, because most of them have been from time to time brought under the consideration of our readers, in our notices of the more interesting monographs devoted to their discussion. We shall therefore confine the present notice to three subjects,—1*st*, Hysterical affections of the larynx; 2*d*, Injury of that organ from boiling water, concentrated acids, and flame; and 3*d*, bronchotomy.

1*st*, *Hysterical affections of the Larynx.*—The *larynx* is subject to two kinds of functional derangement depending upon hysteria, or disordered menstruation, the one consisting in an irritable state of the muscles of the *glottis*, especially those closing the *rima*, the other in deficiency of these powers, producing temporary or permanent *aphonia.* The first species is thus described by the author.

> "An excessively irritable state of the *larynx*, attended by frequent attacks of spasmodic closure of the *glottis*, is often met with in young hysterical females, who are subject to irregular menstruation. The paroxysms, for the most part, come on in the evening; they consist generally of a long-continued loud and convulsive cough, sometimes followed by stridulous inspiration, and of a difficulty of breathing so great as to threaten suffocation; they will continue sometimes for two or three hours without interruption, and not cease till the patient falls into a swoon, or even into convulsions. Occasionally the paroxysm terminates in one of the ordinary hysterical fits. I have never heard of a case of hysterical spasm of the *glottis* ending fatally; but the dyspnœa is sometimes so great, and the danger of suffocation apparently so imminent, that it has been proposed by Dr Albers of Bonn to perform tracheotomy for the relief of the patient. In one instance this operation was attempted by an eminent provincial surgeon. The patient, a young woman, was suddenly seized towards

evening with cough, sonorous respiration, and symptoms of threatened suffocation. Tracheotomy was immediately determined on, but when the operator had made his first incision through the skin and cellular membrane in front of the *trachea,* all the signs of obstructed respiration instantly disappeared. * * * * This irritable state of the *larynx,* and the disposition to spasm of the muscles of the *glottis,* when dependent on hysteria or disordered menstruation, may in a general way be readily distinguished by the absence of pain, and soreness in the laryngeal region, as well as by the paroxysmal nature of the attacks. The complaint is much more distressing than dangerous, and tracheotomy cannot be rendered necessary for its relief by anything short of absolute suffocation."—Pp. 213, 214, and 216.

The treatment which the author recommends during the fit is that usually employed during paroxysms of *hysteria ;* the throwing of cold water over the face and neck ; the application of ammonia to the nostrils, or the exhibition of a powerful emetic. To prevent a return of the affection, attention must be paid to the general health, and especially to the menstrual function.

Hysterical women are occasionally affected with *aphonia*, unaccompanied by any appreciable disease of the *larynx.* It comes on suddenly, and, after continuing for months or years, disappears as suddenly as it appeared. The recovery is not always permanent. In some cases it appears to depend on dysmenorrhœa, in others on a highly nervous and debilitated state of the system, in which it resembles that succeeding violent diarrhœa, or sudden and profuse hemorrhage. According to Sir B. Brodie, this affection occurs in the male sex, especially among clergymen, and the cause in such instances he conceives to be, a sedentary life, and speaking in public in a tone raised above the ordinary standard. This form of *aphonia* may be distinguished from that resulting from chronic *laryngitis*, by the previous history of the case, the absence of pain, heat, or swelling, the suddenness of the attack, and the temporary return of the voice from strong excitement.

In this affection the indications of cure are first to restore the general health ; and secondly, the tone of the muscles of the larynx. To fulfil the first, if the patient suffer from flatulence, costiveness, or any derangement of the catamenia, these affections must be removed by appropriate remedies, and if the aphonia depends on one of these, or a complication of two or more, it will be most probably alleviated or cured when these disorders are put an end to. In hysterical patients, the usual treatment of hysteria must be had recourse to. *Aphonia*, depending upon mere debility from excessive evacuations or discharges, will generally yield to a stimulating or tonic treatment. Emetics are said to have suddenly and permanently restored the voice, of which Dr Carmichael Smyth relates an instance.

> " The local treatment of aphonia is very imperfectly understood. The operation of local remedies is uncertain in the extreme, and in scarcely any two cases do they produce similar effects. Blisters, rubefacients, issues, in short the whole class of revulsive and derivative applications, have been extensively tried, and, though apparently attended in some instances with success, they have completely failed in by far the majority of cases. Galvanism and electricity have also been frequently successful, and as frequently have failed ; *a priori*, we should be led to expect beneficial results from their uses, and I am inclined to think these well worthy of a full and long-continued trial. The electric fluid should be directed along the course of the superior laryngeal nerves."—P. 221.

Mr Ryland does not place much faith in M. Trousseau's plan of treatment,—the application of nitrate of silver to the affected parts. He considers the plan harmless, and therefore proper to be had recourse to when other methods fail. It is most likely, he thinks, to be serviceable in weakness or dissonance of the voice arising from frequent catarrhs, or great vocal exertions combined with exposure to the atmosphere, provided no inflammation be present.

2. *Injury of the Larynx from drinking boiling water and concentrated acids, and from the inhalation of flame.*—Scalding of the glottis, from drinking boiling water from the spout of a tea-kettle, always occurs in young children who have been accustomed to help themselves to cold water in a similar manner.

> " The general course of the symptoms produced by the attempt at swallowing boiling water is, in the first instance, inflammation, swelling, and rapid vesication of the tongue, palate, and *pharynx*, which cause deglutition to be exceedingly painful, or quite impracticable. After the lapse of one or two hours, signs of the existence of an obstruction to respiration commence ; this may be occasioned partly by the swelling of the fauces, but more particularly by inflammation about the orifice of the larynx, and the consequent infiltration of the submucous cellular structure. In a short time afterwards the breathing becomes hurried and sonorous ; the inspirations are especially difficult and attended by a stridulous noise like that which is heard in idiopathic croup. If this state is not speedily relieved, the pulse becomes weak and intermitting, the face livid, the extremities cold, and death takes place either in a paroxysm of suffocation, or from the supervention of coma in consequence of the obstructed respiration.
>
> " In many of the cases, frequent attacks of vomiting have come on, in the course of a few hours after the accident, and they have been supposed to have arisen from the swallowing of some of the scalding water having found its way into the stomach ; for the immediate effect of the water upon the pharynx is such a spasmodic

action of its muscles as causes its instant rejection by the mouth; there is therefore great reason to believe, that the boiling water never penetrates farther down the alimentary canal than the pharynx, and that it never reaches any other part of the *larynx* than the posterior surface of this organ and the *epiglottis*. Moreover, it may be remarked with reference to this point, that inflammation of the stomach is not mentioned in any of the cases of this accident, amongst the appearances found in a *post mortem* examination of the bodies; and vomiting is a very frequent attendant in cases of idiopathic croup."—Pp. 265, 266.

The appearances on dissection, which have been recorded in very few instances, are redness and tumefaction of the *fauces* and *pharynx*, an œdematous condition of the *epiglottis* and upper margins of the larynx, and, where the patient has survived for some time, swelling and injection of the mucous membrane of the *trachea* and bronchial tubes. Lymph is sometimes deposited on the inflamed lining membrane of the *trachea*, and in one instance "the œsophagus, to within a short distance of the cardiac orifice of the stomach, presented the usual appearances of a scald, and the cuticle was easily peeled off from parts of the tongue, and upper part of the œsophagus."

As the symptoms and morbid appearances which are presented in such cases resemble those of acute *laryngitis* from any other cause, and as the effect of boiling water on the parts with which it comes in contact is to excite inflammatory action and its consequences in the mucous membrane and submucous cellular tissue, it becomes an interesting question, in what manner the accident referred to is to be distinguished from idiopathic *laryngitis*. The former, according to the author, is to be distinguished from the latter, by the organs within the mouth, which are possessed of an epidermis, being speedily vesicated; by the extreme rapidity of the symptoms; by the simultaneous existence of great tumefaction of the tongue and fauces, preventing the due performance of deglutition, and sometimes also of respiration.

For the relief of this affection, Mr Ryland recommends that leeches should be first applied to the neck in the vicinity of the larynx, and vesication produced on the upper part of the chest by the free application of the liquid blister. To subdue the inflammatory action, also, calomel must be administered in doses proportioned to the age of the patient and the urgency of the symptoms. "As long as the respiration is croupal and very rapid, two or three grains of calomel must be given every hour; when the frequency and labour of breathing diminish, the intervals between the doses may be lengthened to two, three, or four hours, but the administration of the remedy should never be entirely suspended till the patient is convalescent, or till salivation is established."

Symptoms, however, may occur which either render it impossible to adopt this plan of treatment, or require other more immediate measures to save the patient from suffocation. In such cases tracheotomy must be performed, and recourse be had to the mercurial treatment after the operation, which is to be viewed not as of itself a curative measure, but chiefly as a means of gaining time for the operation of other remedies. The success of the operation in cases of scalding has been very variable. In those cases in which it appears to have saved the life of the patient, the exhibition of mercury was continued after it had been performed till the urgent symptoms disappeared, or till the mouth was affected. This circumstance shows, that the mercurial and antiphlogistic treatment should never be lost sight of after tracheotomy in the class of cases now referred to.

"With respect to the time at which tracheotomy should be proposed; whilst we have such weighty evidence in favour of the success of the mercurial treatment, we are certainly not justified in having recourse to the operation in the first instance, without giving a trial to this medicine, assisted, as it may be, by the application of leeches and blisters. If the symptoms, however do not yield to the medical treatment, or if the patient when first seen appears to be in immediate danger of suffocation, tracheotomy should be promptly performed. Blueness of the lips and nails, the occurrence of accesses of suffocation, and the presence of signs indicating the approach of coma, should perhaps more than any thing else, determine us to have immediately recourse to the operation. The existence of a complete impediment to deglutition, would also render necessary the speedy performance of tracheotomy."—Pp. 271–2.

Injury of the Larynx from drinking concentrated Acids.—This is of very unfrequent occurrence, and can happen only when the acid is swallowed by mistake or forcibly administered, and never when taken with the full knowledge and consent of the individual. In cases of suicide by this means the *larynx* is never injured. The epiglottis during swallowing completely covering the upper surface of the glottis, the acid passes down the gullet, without affecting the organization of the *larynx*. If, on the contrary, the acid be taken accidentally, the mistake will be discovered by the time it reaches the pharynx, the muscles of which will be immediately thrown into action, and the acid matter rejected by the mouth and nostrils. The same will occur in all cases of the forcible administration of any concentrated acid.

When the poison is taken voluntarily, the mucous membrane of the mouth, pharynx, œsophagus, and stomach, will present the usual effects of the acid, and all these organs will become corroded, and violently inflamed. When the poison is taken by mistake, the parts chiefly injured are the mouth, pharynx, epiglottis, and sometimes the lips of the glottis, and when forcibly administered to children, symptoms of *laryngitis* accompanied by *dysphagia* will present themselves, and death may take place from the laryngeal affection, though the acid has not reached the œsophagus.

The *prognosis* in such cases is most unfavourable. Still an attempt should be made to save the sufferer, and the treatment, so far as the larynx is concerned, should be directed to subdue inflammatory action, and remove the obstruction to breathing. Leeches and blisters externally, and calomel internally, will form the basis of the medical treatment, and bronchotomy may become necessary if speedy suffocation be threatened.

Injury of the Larynx from the inhalation of flame.—On this subject we shall allow Mr Ryland to speak for himself.

> " I propose the heading of this section with considerable hesitation, because I have been unable to find any mention of the inhalation of flame as a cause of injury of the larynx, either in works upon the subject of burns, or of diseases of the larynx. I shall confine myself, therefore, to the recording of one or two observations of an inflamed state of the *larynx* and *trachea,* which seemed to have had its source in the breathing of flame, or at least of intensely heated air. It is right to state, that the morbid appearances discovered in these cases after death were by no means anticipated, and that the symptoms during life were those of severe bronchitis, without any of that peculiar *dyspnœa* that results from an obstructed condition of the laryngeal aperture.
>
> " Matilda Smith, aged 18, was burnt in a dreadful manner over the whole body, but especially on the face and neck. All her clothes were burnt, and she was enveloped in flame for some minutes. She was brought to the Birmingham Hospital immediately, and died on the fourth day with symptoms of bronchitis. The *larynx* was examined, and the following appearances presented themselves:—There was scarcely any tumefaction of the parts. The epiglottis, the cavity of the larynx, and the upper part of the trachea, were invested with a thin uniform coating of lymph, not organized, and only very slightly adherent to the mucous membrane. Its thickness was greatest on the *epiglottis,* and progressively diminished downwards. The membrane beneath was intensely red or deep purple, but was not much altered in consistence. The mucous membrane of the trachea and larger bronchial tubes was highly vascular."—P. 274.

In another case of a girl 17 years of age, who was brought to the hospital very much burned about the body and neck, and died with symptoms of acute bronchitis in the fifth day from the receipt of the injury, the following were the appearances on dissection.

> " The mucous membrane of the edges of the *epiglottis,* the internal surface of the *larynx,* and the upper part of the *trachea* were of

a cherry-red colour, extremely vascular, pulpy, and rather thickened. The thyro-arytenoid ligaments and muscles were exposed, in consequence of the mucous membrane in these situations; the membrane investing the internal surface of the arytenoid cartilages was excessively red, and had a granular appearance, as if it had been deprived of its epithileum by the action of fire; the internal angles of both arytenoid cartilages were exposed and sloughy. The area of the larynx generally, and of the rima, was not diminished to such a degree as would occasion any obstruction to the passage of the air. There was a thick mucous secretion over the whole lining membrane of the *larynx* and *trachea*. Soon after the occurrence of this last case, I had the opportunity of examining the larynx and trachea of two children, who were lying dead at the same time in one of the public institutions of this town. Both of them had died within twenty-four hours after the receipt of severe burns from their clothes catching fire. One of them, a boy, about four years old, was much burnt about the face, neck, and chest; the inner surface of the lips was also injured by the flame. The whole lining membrane of the *larynx* and *trachea*, and particularly the posterior part of the latter, were intensely red, and very much injected. There was no thickening or pulpiness about the membrane. The trachea was filled with thick mucus. The pharynx was also of a vivid red, the colour terminating abruptly at the commencement of the *œsophagus*. The other child, a girl, about twelve years of age, was burnt on the chest, body, and thighs, but not on the neck or face. The larynx and trachea were congested, but not inflamed, the colour of these parts was of a dull violet tinge, which was owing to the repleted condition of the nervous system of the submucous tissue. The vessels of the surface of the membrane were not injected, the membrane itself was of a healthy consistence, and there was no mucus in the *larynx* or *trachea*.

" The subjects of the first three observations were all very much burnt about the face and neck, and it is therefore certain, that they must have inhaled air at a very high temperature, if not actual flame; they appeared to be suffering before death from acute bronchitis. On a *post mortem* examination, the superior parts of the air passages presented marks of acute inflammation, but of different characters. In the instance of Matilda Smith, the mucous membrane of the larynx and trachea was of a deep purple colour, and covered with a layer of coagulable lymph. In the subject of the second observation, the same membrane was highly inflamed, with loss of substance over the internal angles of the arytenoid cartilages, and the thyro-arytenoid ligaments and muscles; the parts, be it observed, with which the heated air would come into closest contact, on account of the narrowness of the larynx at these points. Whether the loss of substance was produced by ulceration, or by the previous detachment of sloughs, in these situations, it was impossible to determine. The larynx of the little boy exhibited the appearances of incipient acute inflammation, but the time that elapsed between the occurrence of the accident and his death had been so short, that, besides extreme injection of the vessels of the mucous membrane, no other result of inflammatory action was observable. In the last example there was congestion, but no inflammation, and the absence of inflammation must be considered in reference to the situation of the burns being upon the body and thighs only, and not upon the face or neck."—Pp. 274–5–6.

Mr Ryland states he would have no hesitation in assigning the inhalation of heated air as a cause of *laryngitis* in such cases, were it not that no writer on burns mentions such an occurrence. Mr Samuel Cooper mentions the difficulty of breathing and oppression of the lungs, observed in individuals who die from severe burns, and states, that such symptoms are probably owing to a sympathy between the lungs and skin, or else to causes not at present understood. These causes Mr Ryland apprehends to be congestion and inflammation of the mucous membranes of the air passages. M. Marjolin has also mentioned the manifest traces of inflammation of the mucous membrane of the lungs and intestines, as being frequently observed in those who have thus perished. The cause of the bronchial inflammation is admitted by Mr Ryland to be, in many cases, the increased labour thrown on the lungs, from extensive injury of the skin, and consequent suspension of its functions. But he conceives that there may be many other cases in which this bronchial inflammation is attributable to the direct application of lightly heated air to the membrane of the air-passages, in which instances the inflammation will of course be more severe in the upper parts, the *larynx*, and *trachea*.

In the circumstances now alluded to, laryngeal disease would not be easily detected from the general acceleration of the circulation and respiration which always accompanies extensive burns. If detected, its treatment would be antiphlogistic, and if the breathing resembled that of croup, the free exhibition of calomel.

3. *Bronchotomy*.—After a very brief notice of the history of the operation, Mr Ryland considers it under four heads, 1*st*, the modes of performing it; 2*d*, the difficulties and dangers attending it; 3*d*, the cases to which it is adapted; and 4*th*, the causes of its frequent failure.

Bronchotomy is a general term, comprehending two operations, laryngotomy and tracheotomy. Into a description of the plan of performing these operations it is quite unnecessary to enter, as the various steps are accurately described in almost all our surgical text books. We shall therefore confine our remarks to their relative advantages.

A preference is claimed by some for laryngotomy, on the ground that it is much more easily performed than tracheotomy. The crico-thyroid membrane is covered only by integuments, the situation in which the incision should be made being well-marked and prominent, and much less likely to be affected with emphysema than the tissue covering the *trachea*. On account of the slight depth of the wound, an opening is much more easily maintained in the *larynx* than in the *trachea*. Laryngotomy is preferable when the morbid action is transitory or confined to the more external parts of the *larynx*, and where the opening is required merely for artificial respiration. Tracheotomy, on the contrary, should be performed when necessary in acute and chronic *laryngitis*, croup, disease of the laryngeal cartilages, ulceration of the larynx, or where a tumour is formed between the *trachea and œsophagus*. When it is indifferent which operation may be performed, laryngotomy should be preferred, from the less degree of danger which attends it.

> "The age of the patient should have some weight with us, for in young persons the crico-thyroid space is very much smaller than in adults, and would scarcely afford sufficient room for inspiration. The distance between the lower border of the cricoid cartilage and the sternum is nearly the same in adult males and in children, because in the former the larynx becomes so much larger at the age of puberty, that the portion of the trachea above the sternum diminishes considerably in length about this time. On these grounds it would appear that laryngotomy is but little adapted for children, and should not be had recourse to under ordinary circumstances."—Pp. 323–4.

On the question of the preference to be given to cutting out a portion of the *trachea*, or introducing a canula, Mr Ryland makes the following remarks.

> "The removal of a portion of the front of the trachea is by no means unattended with inconvenience. For, in the first place, when the operation is performed at the lower part of the neck, the distance between the surface of the integuments and the trachea is so great, that it becomes a matter of considerable difficulty to cut away an elliptical portion of this tube. The difficulty amounts almost to an impossibility, when the integuments are much tumefied either by *emphysema*, or by serous or purulent infiltration. This step, however, of the operation is greatly facilitated by drawing forward the trachea, by means of a hook inserted underneath one of its cartilaginous rings. In the second place, the removal of a portion of the front of the windpipe, especially in children, may probably occasion a narrowing of the tube at this part to such an extent, as subsequently to interfere with the functions of the organ. The area of the tube is, in the natural condition of the parts, preserved by the elasticity of the cartilaginous rings, which counteract the disposition of the muscular bands at the back to diminish its calibre. But when the centre of two or three of the rings is removed to any

extent, the action of the muscular fibres remains uncontrolled, and the *trachea* becomes in consequence very much narrowed."—P. 306.

In determining the propriety of using the *canula*, the nature, duration, and probabilities of an ultimate cure of the disease for which the operation has been performed, must be taken into account. Tracheotomy prevents suffocation, but does not cure the disease rendering it necessary. If this cannot be removed, the artificial opening in the trachea must be maintained for the rest of the patient's life, and that can be done only by means of a *canula*, since without it the wound would inevitably close. The canula should be as short as is consistent with its maintaining its situation in the trachea during the respiratory movements, of sufficient calibre to allow an abundant supply of air, " completely open, and curved enough to permit the lower extremity to pass downwards in the direction of the axis of the trachea, whilst the upper one, surrounded by a projecting lip, shall be on an exact level with the integuments of the neck."

The only danger is hemorrhage into the trachea, which may produce immediate suffocation, of which Mr Ryland gives some illustrations. Should the urgency of the symptoms be such that the delay necessary for its spontaneous cessation, or for arresting it by appropriate measures, cannot be allowed, the patient must be placed in such a situation as to prevent the blood from flowing into the aperture. " As a general rule, suffocation should be avoided at all hazards, and in many instances it has happened that venous hemorrhage has ceased when the trachea has been opened, in consequence of the relief afforded to the turgid veins of the neck by the restoration of free breathing, and consequently of an unimpeded circulation of the blood." Fatal hemorrhage may occur from extreme carelessness, or from some very extraordinary distribution of the arteries. The danger from an irregular distribution of the arteries may be avoided by following the direction of Mr Burns, and using the knife merely to divide the integuments and *fasciæ*, and clearing the way to the trachea by means of the finger. Venous hemorrhage may also prove dangerous, from its being fully as difficult to control in this instance as arterial. The venous plexus, which is sometimes formed in front of the *trachea* by the superior and inferior thyroid veins, may embarrass the operator, as may also the union which occasionally takes place at the lower part of the neck just above the sternum, between a branch from each external jugular. The *vena innominata* when turgid has been said to be in danger; but Mr Ryland thinks it very improbable that it should ever rise above the level of the sternum, and even if it did, it would still be protected by the interclavicular ligament.

The operation may be rendered difficult by other circumstances, as the fatness of the throat, and the small development of the *trachea*, enlargement of the thyroid gland, especially of the isthmus, glandular swellings, emphysema, or purulent accumulations in the anterior region of the neck. These may be all overcome by various means, which it is unnecessary to mention here.

"The general uses of bronchotomy may be summed up in a few words. It is practised to relieve impeded respiration arising from any cause that produces a mechanical obstruction to the passage of the air from the mouth into the trachea; to extract foreign substances from the air passages; and to facilitate the performance of artificial respiration in cases of suspended animation."—P. 315.

The causes of the failure of the operation stated by Mr Ryland are its being delayed till too late; the accumulation of mucus in the bronchial tubes, in consequence of its not being expelled by coughing, to avoid which the plan recommended by Dr Gregory, in the twenty-fifth volume of this Journal, page 75, might be advantageously adopted; smallness of this artificial opening, and want of attention in keeping both incisions open, and in cleansing them from the secretions ejected from the air tubes. On each of these the author makes some remarks which are well worth perusing.

In concluding our brief notice of this work, it is but justice to Mr Ryland to state, that his work is an exceedingly useful digest of information on the subject of the diseases and injuries of the *larynx* and *trachea*, and that it will form an excellent practical guide to the general practitioner, as well as to the student.

ART. V.—*A Report of the Medical Management of the Native Jails throughout the Territories subject to the Governments of Fort William and Agra. To which are added, some Observations on the principal Diseases to which Native Prisoners are liable. The whole compiled in a great measure from Documents in the office of the Medical Board.* By JAMES HUTCHINSON, A. M. 8vo. Calcutta, 1835.

IN another article, we have occasion to notice the very defective state of some of the civil prisons of India, and the serious mortality which takes place in them. The present publication, though it does not carry the mortality so far, confirms, in many important particulars, the views entertained by Mr Malcolmson on the injurious effects of a low standard of diet to persons under confinement. Throughout the Presidencies of Fort William and Agra, not fewer, it appears, than from 36,000 to 40,000 persons are continually incarcerated; but if the whole of the individuals are taken into account, who are in prison for short periods only during the year, the number will be greatly enhanced.

The offences are not in general of a deep dye; but are connected with an assertion or defence of those rights, "which the miserably tardy course of civil justice," according to the opinion of the author, "has proved insufficient to protect."

When troops on service are exposed to noxious climates, and much privation, disease often produces very serious ravages; but in general, the highest average mortality among the native troops does not exceed 2 per cent.; while it is sometimes as high as 24 and 26 per cent. among convicts, and is never less than from 7 to 10 per cent. There is much discrepancy in the mortality among convicts in different districts; for while in the Benares Circle, it has amounted to 4 per cent. only, in that of Bengal the proportion has been above 10 per cent. It has sometimes happened, too, that mortality varied much in jails not otherwise very dissimilarly situated; and it is always much less among debtors, females, and convicts not sentenced to hard labour, than those with whom hard labour on the roads formed part of the sentence. It was from a consideration of these circumstances that the Medical Board was induced, in the year 1833, to issue a circular letter to the superintendent surgeons of divisions, inviting information on the causes of mortality, and the means of reducing it. From the answers transmitted, and from an extensive personal experience on the subject, the author has been able to communicate the information contained in the present publication.

Confinement in prison is almost the universal punishment in India; for corporal punishment has been proscribed by law; and it is impossible to prevail on the natives to pay the most trifling fine for any little offence, and thus to avoid incarceration. Separation from their families; anxiety and suspense before trial; and the "utter ruin entailed by bribing almost every individual with whom they are brought into contact, both before and after it," have a depressing effect on the mind, and therefore a powerful influence in producing disease. To these may be added, the total alteration of habits to which a prison gives rise; a change, perhaps, in the climate itself, to which the person may have been accustomed; and the disuse of opium or spirituous liquors, which are extensively employed by the natives.

With regard to the *housing* of prisoners, the author considers the quantity of air allowed to each as too small; for while in the military hospitals of Europe, from 600 to 900 cubic feet are considered necessary to each individual, which would, on the average of 800 cubic feet, be the appropriation of a room of 10 feet high, 16 long, and 10 broad to every two patients, not more than 500 feet are allowed to each person in India, and in some instances, (though he suspects there must have been some mistake in the calculation,) not more than 300 cubic feet.

More regard to *ventilation* than has hitherto been employed should, the author thinks, be exercised in the Indian prisons; and the outer walls should never be erected so near the body of the building, as to prevent a free circulation of air, or to preclude the inmates from sleeping in the open air at certain periods of sickness during the hot season. The most imperfect and objectionable part of the arrangements, however, are in what are called the *Puckah* floors or terraces, consisting of stone, tiles, or masonry, plastered over, so as to present a smooth and polished surface.

These floors, though they are well calculated for purposes of cleanliness, are very unsuitable for sleeping on, according to the habits of the convicts; for, being much better conductors of heat than even the bare earth, they are continually abstracting the little animal heat which the weakly frames of the natives are able to generate, and are in this way very unfavourable to health. Coatings of earth, raised platforms of bamboo, or the country netting of Charpoys, are all of them inadequate to correct the evil; which, the author is of opinion, can only effectually be done by the introduction of *boarded cots* into all jails, and jail hospitals, particularly the latter, which could be made of uniform size, and placed together, so as to make a continued platform, easily separable, for the purposes of cleanliness, or in order to isolate a particular individual.

Adequate provisions for the natural calls of the prisoners; a light in the wards at night; and the constant attendance of a police peon, to obtain medical assistance the instant that it may be required, are of essential consequence; and, together with the more obvious means of preserving cleanliness, white-washing should be invariably employed throughout the whole interior of the buildings, at least once a year.

The working of Prisoners is one of the most important points connected with their management; and this the author considers as being carried far beyond their usual powers, and the ordinary labour of the native population. Convicts have likewise frequently to walk a considerable distance, one, two, or three miles, to the place where they work, and this with heavy irons on them; while little attention is given to prevent exposure to the drenching rains which often occur when they are out of doors, nor in providing them with work suitable to their habits, and carried on in sheds erected for protection against the weather.

Classification only attends to the *periods* of confinement, and not at all to the nature of the offence, or the character of the culprit. But one of the most serious evils is the weight of the fetters, which varies from seven to fourteen pounds, and is dependent, " in a great measure, on the amount of the bribe paid to the jailor." Nor are the limits sufficiently guarded against the chafing produced by the irons, so that " two-thirds of the cases in hospital are generally the result of injuries of this kind; and when hospital gangrene breaks out, the ravages which it commits among those apparently trifling cases is truly appalling."

With regard to the *dieting* of prisoners, the author considers their food as too scanty; and thinks that it should be made " at least adequate to the due preservation of their health." They have only time to cook one meal in the day, which is after their return from their work in the evening, whereas he deems it important that a couple of hours should be allowed them in the middle of the day for cooking a meal. So thoughtlessly zealous, however, does it appear, that some magistrates are, in the exercise of their authority, that, as a means of punishment, they have not hesitated to curtail the poor and insufficient pittance which the law allows to those unfortunate creatures, for the support of life.

The clothing of convicts is much neglected, and there is no change of apparel after exposure to drenching rains. In the colder season, every convict is allowed one coarse blanket; but this is served out with so little regularity, or attention to the period when it becomes urgently required, as to have called for the particular attention of the Medical Board to the subject. The author recommends not only that the blankets should be given out in proper time, but that a stock of them should be kept at the disposal of the jailor, so as to enable him to supply a dry one, when required, during the rainy season, and also an additional one during the winter; at the expiration of which, or on the liberation of the prisoner, it might be returned into store.

The *formation of Jail Hospitals* should be conducted on the most efficient principles of ventilation and cleanliness. The surgeons should keep regular reports; a native doctor should always sleep within, or close to the hospital; and no gang of prisoners should ever be at work at a distance, without the presence of one of them,—a plan which, it may be observed, has been recently adopted by the government.

The principal maladies which infest the jails of India are, fevers, dysentery, cholera asphyxia, and hospital gangrene, and on these the author makes some practical observations, in addition to what he has published in the Transactions of the Medical and Physical Society of Calcutta.

Cholera he considers as not " of a highly contagious nature," but as " capable of becoming contagious," in " circumstances favourable to its propagation." In an official circular letter, transmitted by the Medical Board, he gives some judicious directions as to the measures of a preventive nature, which ought to be adopted in cholera, and the general line of practice which ought to be pursued in the treatment of hospital gangrene; and some tables are annexed, which offer statistical views of the prevalence of disease, and the amount of mortality in various quarters. Several dissections are given of dysenteric and fever cases, in which deep and extensive disorganization of the lungs, and vital organs generally, exhibited themselves.

We have seen with surprise and regret, the serious defects of arrangement existing in the hospitals of India; and fear that there has been much want of vigilance in detecting, or of energy in correcting, evils of the magnitude which the present publication, and that of Mr Malcolmson, have laid open. We trust that the Medical Boards of the three presidencies, as well as the medical profession generally, will keep the subject continually in their view; and we have no doubt that the good sense, good feeling, and humanity of influential men, both in the civil and military departments of India, supported as they will assuredly be by the Directors of the East India Company, and the Board of Controul, as well as by public feeling in this country, will in no long time accomplish all those practical improvements which are at present so urgently called for. The system of bribery and corruption, to which the natives are so much exposed, according to Mr Hutchinson's account of the matter, might surely be prevented, in a material degree, by the authority and influence of the British, if their functionaries were sufficiently trustworthy and active.

The perusal of this memoir has irresistibly impressed on our minds the conviction, that, in the management of the debtors, felons, and other persons confined in the Indian jails, there prevails a great deal of cruelty and gratuitous bad usage, and that there is a proportional ruinous waste and premature abridgment of human life, which, under a more judicious and humane system, could not take place. To many of these unfortunate persons, a sentence of imprisonment for a year, or even in some instances a few months, is equivalent to a sentence of death, and that in a manner the most cruel and lingering,—for many who enter these abodes of misery never quit them alive, and are destroyed by the most loathsome and painful distempers. Such a result could never have been contemplated in the framing and administration of the laws by which such punishments are awarded, often for very slight offences.

Surely if fetters and chains be requisite for restraining these prisoners, which may be justly questioned, it must be quite superfluous to have them so weighty, as to cause deep and often incurable ulcers, which, in that climate, and in these crowded prisons, are frequently attacked with hospital gangrene. Imagine also the cruelty of stringing on a single chain during the night, the whole, we suppose, of the prisoners, as Dr Lamb represents those at the civil station of Maldah to be treated. What provision can in such circumstances be made either for health, comfort, cleanliness, necessary repose, or sudden attacks of sickness. Imagine two or three or half a score of such concatenated beings attacked during the night with cholera, diarrhœa, or dysentery, as must not unfrequently be the case. Truly, it may be said, man shows great ingenuity in rendering his fellow-creatures as wretched as possible, and counteracting as far as may be in his power the beneficial effects of those provisions which the Benevolent Ruler of the Universe intended all to enjoy. Is pure air requisite for the maintenance of life, and the preservation of health? Then it must be vitiated to as great a degree as possible, by accumulating within a most limited and circumscribed space, a number of human beings, who ought to be scattered over ten times the extent, and who poison each other by the reciprocal influence of the secretions of their persons. Does health require that each should have so much personal liberty as to attend to personal cleanliness, and the calls of nature? Then scores or hundreds of human beings, sick and healthy, must be chained and confined together, so that the sick may poison the sound, and the dead may disgust if not kill the living; and, as if war, famine, and the malignant passions could not thin the human race with sufficient rapidity and certainty, immense nurseries of artificially created and fatal diseases are established, and compelled to contribute their influence to the general result. All this, be it remarked, is accomplished under the sanction and authority of the most benevolent, humane, and paternal government in the world. At Bancoorah jail, during the year 1833, among a population of 529 persons, 130 died, giving a mortality of nearly 25 per cent., or one in four. At the prison of Shergottee, during the same year, among a population of 503, 131 persons died, giving a mortality of more than 26 per cent. But these are mere trifles compared with the wholesale destruction perpetrated during the same year, at Dinagepoor, where, among a population of 349 persons, 202 expired, giving a mortality of above 57 per cent. These 349 persons were confined, some for debt, some for alleged slight offences against each other, not established by trial, and others, probably a small proportion, for misdemeanours and crimes visited by imprisonment for some months, or a year or two. Would these 202 persons have died had they not been confined? The answer from most of the medical officers is, that all were not likely to die, perhaps not half a dozen. Who is to be blamed, then, for their deaths, produced, it is to be observed, by diarrhœa, dysentery, cholera, and hospital gangrene? The answer to this question is not difficult. If any one doubts either as to the facts or their explanation, we refer him to the memoir of Mr Hutchinson itself.

ART. VI.—*A Letter to the Right Honourable Sir Henry Hardinge, K. C. B., M. P., on the effects of Solitary Confinement on the Health of Soldiers, in Warm Climates.* By JOHN GRANT MALCOLMSON, F. R. A. S., and M. G. S., Surgeon E. I. C. Service, late Secretary Madras Medical Board. Pp. 23. London, 1837.

THE observations contained in this pamphlet evince great judgment and philanthropy, together with an extensive knowledge of the subject; and thus cannot, we should therefore hope, fail to attract the attention of the official persons, through whose means the evils complained of can be most effectually and readily corrected. The author is no friend to corporal punishment in the army, which he considers as in most cases ineffective in preventing offences; but then, on the other hand, he is of opinion, that the very general disposition which now exists to avoid the infliction of the lash, has led, in the introduction of solitary confinement, to the substitution of a punishment still more cruel and destructive to the future health and well-being of the soldier. The revolting nature of military flogging, and the necessity that the officers who award it, should, in most cases, witness its infliction, are themselves guards against its frequent employment; but because confinement produces no immediate bodily pain, its ultimate effects are apt to be overlooked.

The author regards it as very important to the welfare of soldiers, that the discipline should be strict, and the punishment of outrage, severe, and certain; but he deems it highly improper for their employments and pleasures to be unnecessarily interfered with; and has seen with pleasure, that in an European corps in India, when every man was strictly required to do his duty, so much attention was paid to his comforts, and so little of annoying restriction imposed, that the gates of the barracks were usually left open, while solitary confinement was seldom called for, and one example alone of corporal punishment occurred during a period of several years. The measure of punishment, as the author very properly lays it down, should never be greater than the offence; nor of a kind to injure permanently the health, or affect the life of the individual subjected to it; and these effects he feels himself warranted in attributing to solitary confinement, in the way that it is frequently employed.

The author's attention was first directed to the subject, by the effects of a general order which was issued in April 1832, at the Madras presidency, which enacted, that persons under solitary confinement, should be restricted to bread and water, unless the medical officer should deem it necessary to make any alteration. Soon after this order was carried into effect, his attention was forcibly attracted by a peculiar train of symptoms which appeared in two patients admitted into the hospital, both of whom had been in solitary cells, and subjected to the reduced diet. On these cases the author made a report, and mentioned his suspicions that the system was injurious, though his experience did not, at that time, warrant a positive opinion on the subject. In the course of two years' attentive observation, however, he felt no hesitation in officially expressing a decided opinion, that protracted solitary confinement, more especially when united to a diet of bread and water, is exceedingly injurious to health. The following is a succinct and interesting account of the phenomena which presented themselves to his notice under such circumstances.

"Many men, particularly those of indolent habits, endure a confinement of four or six weeks, on bread and water, without injury to their health; but, in some instances, a shorter period is sufficient to cause a total loss of appetite,—the bread is hardly touched, and on other food being allowed, the patient is unable to eat or to digest it. The stomach becomes weak; there is uneasiness across the region of the stomach, spleen, and liver; the latter is torpid; the bowels are confined, or they are relaxed with slimy discharges unaccompanied with pain, yet the swollen red tongue indicates the existence of irritation of the mucous membrane of the digestive canal. The pulse is quick and feeble; and the clammy skin, vertigo, debility, headach, and sleeplessness, show how much the constitution suffers from diminished nervous power. The convalescence is slow, and the treatment requires to be adapted to the enfeebled state of the system, The effect is, however, more clearly seen in men sentenced to six or twelve months solitary confinement Two of these were in hospital at the same time, with decided symptoms of scurvy:—one was admitted after five months confinement. during part of which he had been allowed extra diet at my recommendation. It was observed, that for some time previous to his removal to hospital, his daily allowance of bread was removed almost untouched. He complained of pains of the limbs, along the spine, and across the loins; tenderness of the shin bones; hardness, pain and feeling of stiffness of the calves of the legs, and the skin over the painful muscles was of a dark livid colour from effused blood. The gums were spongy, livid, and retracted, and he suffered from sleeplessness, some pain of the region of the liver, and slight griping. The tongue was yellow and its edges red. The other had been a shorter time in confinement, and complained of debility, disorder of the bowels, pains of the shin bones, &c. &c. A blister was applied, which caused a foul sore, from which dark-coloured blood flowed on the slightest touch. My friend Mr James Shaw, having furnished me with a report on the health of these men, two years after I left the regiment, I am enabled to state, that the one had hardly been out of hospital during that time, and had not then completed his full period of confinement; and that the other, was very frequently on the sick list with a variety of complaints. Indeed, very few men are able to undergo a long period of solitary confinement on bread and water, without being much in hospital during the period of sentence; and many continue to suffer from the various diseases to which men of exhausted constitutions are so liable in warm climates. It may not be improper to add, that I have observed the minds also, of prisoners confined for long periods, more especially when on a diet they believe to be destructive to their health, to become gloomy, or even furious, and disposed to commit every crime; a fact which was forcibly stated many years ago, in the House of Commons, by Sir Robert Peel, in reference to the substitution of solitary confinement for other punishments in this country. When the solitary confinement is long continued, the severity of the punishment is increased in a much greater proportion than the length of time, and any addition in the shape of restricted diet, which may be necessary in short confinement, is quite uncalled for: the long seclusion without employment is itself sufficient." —P. 12–15.

Mr Shaw adds his own opinion of the practice in the following words. ' I suspect," says he, " that it (solitary confinement) will be found to be the most expensive punishment that the Government has ever tried, and which, in my opinion, is the most cruel that could have been invented; but which, if the diet were changed, would make an admirable one."

Most of our readers are acquainted with the train of symptoms which occurred among the prisoners at Milbank, many years since, and which bear a striking analogy with those which are here described; and the author gives many examples of the deleterious effects of insufficient diet in military expeditions from India, in Arabia, and in Egypt. In the great jails of India, mortality takes place to a fearful extent; for in a table given by the author, comprising the years 1833 and 1834, it appears, that the amount of mortality was 24.70, and 26.20, per cent. at Bancoorah and Shergottee; 35.42 at Rajahmundry; 38.42 at Coimbatoor; and 57.71, at Dinagepoor. Part of the evils attaching to these prisons, arises, in the author's opinion, from the attendance on those establishments now falling solely on young men, owing to the late reduction of the pay of medical officers to what he terms " a mere pittance;" for it must be obvious, that when gentlemen, are in very early life, intrusted with such serious responsibilities, one-seventh are not only ignorant of the habits of the native population, but are without the authority which age and experience impart to the opinions of medical men in the eyes of the civil authorities, and have not therefore sufficient weight to meet the exigencies which so often occur, in the exercise of their official duties. If the author is correct in his statements, the interests of humanity cannot but be materially affected by this ill judged parsimony.

The author has conferred an important obligation on the public, by making known his sentiments on the topics of which he treats in the present pamphlet. The main object of punishment is to prevent crime; but though it is desirable to exercise certain degrees of severity, in a scale somewhat proportional to guilt, yet the powers of the Legislature are soon met by the insufficiency of the faculties of nature to bear more than a certain degree of infliction, without permanent injury to health. "Sufficient food and exercise," as the author well observes, "must be allowed to a prisoner, *if it be intended that he should afterwards be of use to himself, his family or country*:" But we would go a little further, and contend that he ought to have not only an amount of exercise, and such a portion of nutriment, as are necessary to preserve as fair a portion of health as is compatible with confinement within the walls of a prison; but that no punishment is either humane or constitutional, which unfits him, after liberation, from following his usual avocations in life. We would add, too, that while attention is paid to the body, the mind ought not to be neglected; and that care should be taken by means of classification and inspection, to guard against a culprit leaving a prison more contaminated by the nature of his communications, while there, than before he entered it.

ART. VII.—*De Inflammatione Ossium eorumque Anatome Generali, Exercitatio Anatomico-Pathologica.* Auctore FRIDERICO MIESCHER, Med. et Chir. Doct. Cum Tabulis Quatuor Aeneis. Berolini, 1836. 4to, pp. 281.

WE have merely space to notice the appearance of this memoir, which may be characterized as the fullest and most complete history extant of the healthy structure and the morbid changes of bone.

It consists of two parts, an anatomico-pathological and a pathological. In the first, the author explains at considerable detail the anatomical structure of bone in its healthy state, considers its manner of growth and developement, and after a full view of the periosteum, the marrow, and the vessels, concludes with some observations on the life, nutrition, and growth of bones.

In the second part the author treats of, *a.* increased formative action in bone, embracing hypertrophy of bone, hypertrophy of the medullary tissue and inflammation; *b.* diminished formative action in bone, embracing atrophy, erosion and *tabes*; *c.* perverted formative action embracing rickets, *mollities ossium*, and preternatural brittleness; and lastly, the heterologous structures in bone. In a second section of this part, he considers more fully adhesive inflammation, and secondly, suppurative inflammation in bone, and necrosis and reproduction.

To the memoir is appended a short essay by Professor Müller, containing microscopical observations on the *canaliculi* of bones, and the mode in which the earthy matter is disposed in the osseous tissue, illustrated by instructive figures.

PART III.

MEDICAL INTELLIGENCE.

CHEMISTRY.

Liquidization and Solidification of Carbonic Acid Gas.—It is well known that it has long been an important problem in practical Chemistry, to reduce to the liquid and solid form those gaseous bodies, which, being hitherto only known in the gaseous shape, have been very generally denominated by chemists *permanently elastic fluids.* This denomination, there is now reason to presume, from the advanced progress of chemistry, and the increased power of its resources, will be no longer justly applicable.

It is known, at least, that chemists have lately succeeded in liquefying carbonic acid gas, or causing it to assume the form of a liquid, chiefly by means of very great pressure. Mr Faraday, in this country, made the gas assume a liquid form, by subjecting it, within a strong glass tube, to the pressure of 36 atmospheres at 32° of Fahrenheit's thermometer; and M. Thilorier of Paris produced in 1835 the same result in a similar manner. (Annales de Chimie et de Physique, Tom. lx. p. 427 and 432. Paris 1835.) In this state, if allowed to escape, it immediately evaporates, and a most intense degree of cold, estimated at —180°, is produced, while part of the carbonic acid is converted into the solid form, in the shape of small whitish woolly flocks or masses, which are intensely cold, and which adhere so strongly to the walls of the glass, that it is impossible to get it out by any other method than breaking the flask. This is the solidified gas; in other words, a substance supposed to be permanently elastic and gaseous, converted into a solid.

On Wednesday, the 14th February 1838, this interesting experiment was performed in the chemical class-room of the University, in the presence of the Fellows of the Royal Society, the Fellows of the Royal Colleges of Physicians and Surgeons, and several literary and scientific gentlemen.

Mr Kemp, practical assistant to Dr Hope, Professor of Chemistry in the University, had, by the combined effects of high pressure and intense cold, reduced carbonic acid to the liquidized form with a degree of facility, which enables him to present it in considerable quantity, and perform with it several striking and interesting experiments. His method is to confine the gas thus liquidized in a very strong cylindrical vessel of copper, which is provided with a stop-cock, from which the liquefied gas is allowed to escape in the quantities, and at the rate which the experimenter deems proper. To one side of this vessel, also, is attached a glass tube, communicating with the interior of the copper cylinder, and in which the liquefied carbonic acid gas may be seen.

Dr Hope first allowed a quantity of the liquefied gas to escape by turning slightly the stop-cock, when it rushed out with a peculiar hissing sound, and was received in an ordinary glass flask. As it issued, part evaporated, and at the same time was formed in the glass flask a quantity of white friable solid matter, which fell to the bottom of the vessel, and could be heard striking against the interior as it was shaken or moved. This substance is intensely cold, and the degree of cold produced is so great, that it is impossible to touch the glass with the uncovered hand. The flask was, after a sufficient quantity had been received, broken, and a mass of solidified carbonic acid gas, as large as a filbert, was then presented to view.

The theory of the solidification in this case, Dr Hope explained, was, that, while part of the liquidized gas is evaporated, the moment the weighty pressure is withdrawn, the cold produced is so intense, as to reduce from the liquid to the solid form the residual part. Thus incessantly as a jet of liquidized gas continues to escape, part is evaporated, and the cold thus produced is sufficient to freeze the rest.

The next experiment was a very conclusive one. It is well known that mercury requires for its congelation a temperature of —40°, that is 40° below zero of Fahrenheit. A quantity of the liquidized gas was allowed to issue from the copper cylinder, and received into a glass flask, in which was introduced a quantity of liquid mercury. In the space of two minutes it was frozen into a solid mass, which could be divided with the knife. A portion of this mercury dropped into a glass of water gradually but rapidly fell down in its usual fluid form, while in its place was left a mass of ice of exactly the same shape and size. This shows that the cold capable of being produced by the solidification of carbonic acid gas must be very great.

MATERIA MEDICA.

On the grains of Teel *or Till or* Ramtilla, Nook *in Abyssynia,* Verinnua *or* Kutrello *in Indostan, and the edible oil obtained from it.* (Journal de Pharmacie, No. vii. 23d année, July 1837.)—Of this oleaginous seed, which, on account of the abundant oil so easily obtained, is very well cultivated in all hot countries, eleven hundred bags have been recently imported from Calcutta into France.

This very minute grain, *akene* of botanists, consists of a quadrangular oval *bursa* opening at the base with four valves, which has caused it to be arranged by some authors with the genus *Tetragonotheca.* Its colour is tawny or brown; it is remarkable neither for smell nor taste; and it furnishes little mucilage but an astringent principle. It is sufficient to crush and squeeze forcibly these seeds, with or without the aid of heat, to obtain a limpid oil, which has nothing disagreeable in taste, and which may be used at table, without, however, surpassing that of the poppy seeds or sesame seeds.

It was formerly said, (Journal de Pharmacie, Tome xxi. p. 105.) that the *Ramtilla* of the East Indies and Abyssinia belonged to the family of the *Compositæ.* It approaches the Senecios, and resembles our marigolds, with little yellow flowers. Its grains, placed in the centre of the floral disc, are void of tufts. As it can live only under tropical skies, the plant is not susceptible of cultivation in Europe. Meanwhile, as it is an annual, it might be practicable to propagate it in certain localities, well exposed, and sheltered from the cold, in the southern countries, on account of its great utility.

The following is a list of the botanical names by which this plant has been designated in the systems of different botanists.

In 1781, the younger Linné called it a *Polymnia Abyssinica,* after the *Polymnia frondosa* of Bruce, (Travels to discover the Source of the Nile, 4to. Vol. iii. p. 575.) or Nook of the Abyssinians, by whom it is cultivated.

It is the *Verbesina sativa* of Roxburgh, Catalogue, p. 62, and of Sims, (Botanical Magasine, pl. 1017,) and of Ainslie, (Materia Indica, Vol. ii. p. 256.)

Verinnua of Heyne, Tract on Ind Plants, p. 49.

Parthenium luteum of Sprengel, Nov. Prod. 1818, p. 31.

Jaegera Abyssinica of Sprengel, *Systema Plant.* 1826, p. 590.

Heliopsis platyglossa of Cassini, Dict. Botanique, p. 332.

Guizotia Abyssinica, Cassini, Dict. Botanique, (1829) p. 248.

Tetragonotheca Abyssinica of Ledeboer, *Index horti Dorpatensis,* supplement, 1824, p. 7.

Helianthus oleifer of Wallich, *Catal. et herbas.,* No. 319, Bidens? *Ramtilia* of Wallich, No. 3191, comp. 301. Anthemis Mysorensis of Wallich in his Herbarium of Madras.

Ramtilla oleifera, Decandolle, Mem. de la Société de Geneve, 1833, and in Contributions to Indian Botany by Wight, p. 18.

Guizotia oleifera, Decandolle, Prodromus Systematis Regni Vegetabilis, Tom. v. 1836, p. 551.

Buphthalmum Ramtilla of Hamilton, Herbarium.

Of this plant two varieties are known. The cultivated variety (*sativa*) has leaves larger, well-grown leaves, elongated, lanceolate, broadly denticulate, with foot-stalks in corymbiferous branches. Of the wild variety, (*angustior*,) the leaves are almost linear, and the branches are axillary, floriferous, and very short.

Diuretic operation of the Aralia hispida. By Doctor OLIVER PECK.—The *Aralia hispida* grows very abundantly in the country of Massachusetts, and has for several years been employed by physicians as a diuretic. It is there called hycbla, on account of its resemblance to the *Sambucus Canadensis*, although it is a much smaller plant. It grows in cultivated lands which have been neglected, and scarcely attains the height of a foot and a half. Its stem is tufted at the base, and covered with hard spines; its leaves are sessile, deeply denticulated, about one inch long; the footstalks terminal and axillary, bearing from two to four umbels; the flower of a greenish white, with reflected petals; and the root of a sweetish taste.

It is the root that is preferably employed, and in decoction it is taken *ad libitum*. To the advantages of an energetic diuretic operation, it unites that of being agreeable in taste, and more easily endured by the stomach, than all the other remedies of the same kind. The author relates a case in which the administration of this plant in a woman labouring under diseased heart, produced more relief with much less inconvenience than a great many other diuretics. But no details illustrative of its physiological operation and effects are communicated.

Properties of the Ceanothus Americanus. By Dr HUBBARD.—This plant, which grows very abundantly on the dry sandy flats of America, appears to possess very powerful astringent properties.

It is described in the following manner by Professor Bigelow.

Leaves cordiform, thinned, with triple nervation, two or three inches long by one broad, with fine teeth, terminating in one long point. From the axilla of the superior leaves are detached leafless branches, which terminate in clusters of small white flowers, followed by berries almost triangular.

The leaves of this plant were employed as a substitute for tea during the period of the American revolution, when the refusal to admit into American ports tea which had come from England, and with the English duty, was followed by the almost total want of that article. The taste of these leaves is slightly bitter and astringent. The first occasion on which they were employed by Dr Hubbard, was in the case of an old lady labouring under an aphthous eruption in consequence of typhous fever, and in whom the ordinary gargles produced no effect. At the end of two or three days the throat was invariably covered with a thick layer of a still deeper colour, beneath which was seen the mucous membrane of a bright red, and acutely sensible. After borax, alum, and nitrate of silver had failed, he made a strong infusion of the *Ceanothus*, which acted like the effect of enchantment. The eruption disappeared and did not return. Since that time Dr Hubbard had employed it advantageously in the treatment of the aphthous affections of infants, in the treatment of malignant dysentery, and other disorders distinguished by debility. He allows, however, that his success has been more complete when he has added a small quantity of borax to the infusion of *Ceanothus Americanus*. The root has been long employed in chronic diarrhœa and in other analogous affections.

On the Physiological and Therapeutic Properties of the Leaves of the Peach Tree, (Amygdalus Persica,) employed as a Sedative. By Dr AN-

TONY.—During the Summer of 1831, while a fever of remittent type, of extraordinary severity, and complicated with intense gastric irritation, prevailed, the patients could not keep on the stomach the lightest fluid or drink. The gaseous waters and iced water were even often rejected. Sinapisms and epispastics were employed without success. The author, thinking that the cherry-tree-laurel water was indicated in this class of cases, was desirous to substitute in its place the leaves of the peach tree, which he also supposed to contain prussic acid. Of these he made an infusion, which he administered in doses of half an ounce every quarter of an hour, or every hour, according to the urgency of the symptoms. Never was the fourth dose given without the symptoms being completely allayed, and at the same time the burning thirst, of which the patients complained, failed not to be quenched; and, notwithstanding the bitterness of the drink, not only did the patients feel no disgust at it, but they requested it importunately.

The author also states, that he derived good effects from the application over the epigastrium of the leaves which had been used to make the infusion.

The same remedy equally succeeded in his hands in arresting vomiting, in two cases of simple cholera, and in many cases of the cholera of infants. Dr Dougos relates also, that he had obtained favourable results from the employment of the same remedy in the treatment of hooping-cough. It is requisite for this purpose to take daily one pint of the strong infusion, in small doses; and at the end of four or five days the disease usually disappears.

Analysis of a species of clay found in the Canton of Richmond in America, which is sought by many persons, and especially by children, as food. By Professor COTTING.—This earth, the colour of which varies from deep yellow to white-red, is met in masses and beds presenting undulations. It has a very fine grain, is soft, may be polished with the nail, and adheres to the tongue. When moist, it emits an argillaceous odour, falls to the bottom in water, and does not form a ductile paste.

One hundred parts furnished

Silica, - -	31
Oxide of iron, - -	12
Alumina, - -	34
Magnesia, - -	10
Water, - -	12
Loss, - - -	1
	100

It contains no relics of animal matters; but it presents vegetable matters in the state of putrefaction and lignite. It is found associated with several other minerals on several elevated points. The purest is found in the county of Richmond. Its taste is sweetish, similar to that of calcined magnesia. Persons worthy of credit, who dwell in the neighbourhood of this canton, state that they have often seen those persons die, who, by a vitiation of taste not easily explained, make frequent use of this article as food.

Kreosote in Gonorrhœa, Gleet, &c.—Dr Robert Dick, (Glasgow,) begs, through the medium of this Journal, to call the attention of the profession to the use of kreosote in the chronic stage of gonorrhœa, and in gleet. He has tried it in some cases, and thinks its beneficial effects are more obvious than those of copaiba. He has administered it in doses of two drops a day, with loaf-sugar beaten into syrup with water.

Whether it may be effectual in some species of impotence, and in chronic pulmonary catarrh, remains to be seen.—*Glasgow, March* 1838.

An Appeal to Physiologists. (From the German of Froriep's Notizen, Vol. iii. p. 344.)—Man may *use* animals, but he may not *abuse* them. The necessity for instituting physiological experiments on living animals, we do not deny; but, for the sake of humanity, we may perhaps be allowed earnestly to entreat that, as soon as the object of the experiment admits, the animal may be put to death. Very often do we see experiments performed on living animals in cases where one just previously deprived of life would answer the purpose quite as well; and how frequently does it not happen, that a mutilated creature is carelessly thrown away and left to breathe out life, by slow degrees, in the cruelest of tortures. The writer once saw, in illustration of a lecture, the heart of a frog laid bare and beating. Four-and-twenty hours afterwards, he found the same animal on the same table, where it had been carelessly left lying; its heart still beating!

If the sufferings of the poor animal be not regarded, it may perhaps be worth considering, whether there may not be thus produced a hardening effect upon the minds of the youthful pupils of science, and whether society at large may not suffer through the consequences. If it be undesirable that a butcher should fill the office of a juror in cases affecting life, this presupposes an obtundity of feeling; and if here the slaughtering and subsequent cutting-up of animals produce such an effect, how much more must not the *reckless* dissection of *living* ones, deprave the heart and render it incapable of sympathizing with suffering humanity?

Acupuncture, Compression, and Iodine Injection employed for the cure of Hydrocele. By M. A. Velpeau, (Archives Generales de Medecine, 3d series, Tome i. p. 29. January 1837.) In the twenty-fourth volume of this Journal, our correspondent, Dr Cumin, now Professor of Midwifery in the University of Glasgow, in a short paper on the treatment of ganglion, proposed, in 1825, to attempt the cure of hydrocele by opening a communication by means of a cataract needle between the cavity of the *tunica vaginalis* and the cellular tissue of the scrotum. [Edin. Med. and Surgical Journal, vol. xxiv. p. 97.] Several years elapsed, however, before it was applied to practice, which was at length done by two English surgeons, Mr Travers and Mr Keate, (Medical Gazette, Vol. xix. p. 137 and 789, 1837,) and about the same time apparently by Mr Lewis. The method has been tried in the Royal Infirmary of this city by Mr Syme, the Professor of Clinical Surgery, and Mr Watson, one of the surgeons to the institution, in a considerable number of cases; and with a very general degree of success. By M. Velpeau it has been subjected to clinical experiment in comparison with other means, and its merits as a therapeutic agent have been estimated rather below the method of injection, and especially by iodine injection.

This surgeon tried first simple acupuncture, but without success, in two cases. He then, instead of leaving the needle in its place, passed a thread cross-wise through the tumour in two other cases, thus reviving the old method by seton. On the third day these setons were withdrawn; suppuration followed, and the cure took place, but more slowly, and with more inconvenience, than by the vinous injection. The treatment of one case appears to have occupied sixty-four days.

The second method attempted by M. Velpeau was compression by means of plaster after puncture. This he employed in three cases, by applying over the scrotum and testis, immediately after puncture, slips of adhesive plaster, so close as to keep the corresponding surfaces of the vaginal coat in contact. The fluid nevertheless was reproduced.

The third method used by M. Velpeau consisted in, after emptying the vaginal coat in the usual manner, injecting into its interior a mixture of water and the tincture or alcoholic solution of iodine, in the proportion of from one to two drachms of the tincture to one ounce of water. After injection the part swells for three or four days, but without causing fever or serious pain. Resolution then begins and proceeds rapidly. This method M. Velpeau employed in twenty cases, and in none of the patients did the slightest bad symptom take place. Eighteen of these cases were cured in less than twenty days. In one of the two others resolution was only half effected on the 31st day; and he repeated the injection, and the cure was then rapidly completed. The 20th patient, who had a hydrocele with two cells, remained six weeks in hospital on account of swelling of the testicle. Of the other eighteen, in two, vinous injection and cauterization had been used without avail; two had encysted hydrocele of the chord; in three the tumour contained about twelve ounces of serum; in ten the testicle was hypertrophied, irregular, and long diseased; in all except two the disease was of more than six months duration. Two had it for fifteen years, and one had it twenty-four years.

In this method distension by the injected liquid is unnecessary; and hence there is less risk of regurgitation, or injecting it into the scrotum. From the dissection of the scrotum of one patient who died in consequence of amputation, it appears to produce general adhesion between all points of the vaginal coat, and thus to render relapse impossible.

Harveian Society. Notice to Students of Medicine.—The Harveian Society of Edinburgh have fixed on the following subject for their Prize Essay for the year 1839, viz.:—"*An Experimental Inquiry into the local and general effects of the Deleterious Gases, distinguishing those which do, and those which do not, enter the Lungs.*"

Dissertations on this subject must be transmitted to one of the Secretaries, on or before the 1st day of January 1839. Each Dissertation must be accompanied by a Sealed Letter, containing the Name and Address of the Author, and inscribed on the back with a motto. The same Motto must also be prefixed to the Dissertation to which the Letter belongs. None of the Sealed Letters are ever opened, except that bearing the same Motto with the successful Essay.

The Prize given by the Society, to the successful Candidate, is either a copy of the quarto Edition of Dr HARVEY's Works, published by the Royal College of Physicians of London; or, if the Candidate prefer it, a Silver Medal of the same value, with a suitable Inscription.

The Candidate is at liberty to employ his Essay afterwards, in any way he may think proper: And, accordingly, some Dissertations submitted to the Harveian Society, have, in consequence of publication, been productive of considerable honour and emolument to the Authors.

By order of the Society,
RICHARD HUIE, M. D. 8, George Square, } *Secretaries.*
P. D. HANDYSIDE, M. D. 10, Shandwick Place, }
EDINBURGH, *March* 12, 1838.

Dr John Home.—We regret to say that this gentleman died on the morning of Sunday the 18th March 1838, being the ninth day of an attack of typhoid fever, caught in the discharge of his duty as physician to the Royal Infirmary. Dr Home had acted for six years as pathological clerk in the Royal Infirmary, and had distinguished himself in that situation by his persevering study of morbid anatomy, and his knowledge of pathology; and was in every respect a physician of much accomplishment and great promise. His first publication in the last number of this Journal was a proof of his great industry and his accuracy; and showed, that had his life been continued, the highest expectations might have been justly formed of his services to the improvement of Medical knowledge.

Literary Notice. Sir Anthony Carlisle, F. R. S., President of the Royal College of Surgeons, and Surgeon to the Westminster Hospital, has in the Press a Work, entitled "Practical Observations on the Preservation of Health, and the Prevention of Diseases:" comprising the Author's extended experience on the Disorders of Childhood and Old Age,—on Scrofula,—the Efficacy of Purgative Medicines,—the Prevalent Diseases and Health of London, &c. &c J. Churchill, *Prince's Street.*

INDEX.

Academy of Sciences, the fifth and sixth volumes noticed, 222, 232

Accessory nerves, on their functions, 165

Acid, carbonic, on its liquefaction and solidification, . . 599

Adulteration, report on that of drugs by the Edinburgh College ot Physicians, ... 321

Ague, M. Maillot on those of Africa, 571

Air in the veins, on, as a cause of death, ... 209

Air, condensed, on its use in deafness, ... 314

Almanack, British Medical, for 1838, . . - 274

Aneurism, varicose, on, . 263

Animals, on unnecessary cruelty to, in physiological experiments, 602

Anthracosis, Dr Stratton's case of 490

Apothecaries in Dublin, on the plan of regulating the practice of, 317

Aralia Hispida, on its therapeutic effects, , . . 601

Arsenic, on its use in plethora, 313

Artery, iliac, state of vessels after ligature of, . . . 271

Association, Medical and Surgical, Provincial, . . 304

Atlas, case of fracture of, not instantly fatal, ... 265

Atrophy of bones, observations on, 271

Bardsley, Dr, his Retrospective Address, ... 305

Black expectoration and spurious melanosis, 260, a case of, . 490

Bones, on the atrophy of, . 271

Bushe, Dr G., his work on Diseases of the Rectum, . . . 275

Cæcum, on its ulceration and perforation, ... 258

Cæsarean section, case of, terminating favourably, . 227

Carbonic acid gas, on its liquefaction and solidification, . 599

Ceanothus Americanus, on its therapeutic uses, . . 601

Chancre, Dr Ricord on, . 474

Chaussier, notice of, . 222

Cholera, Dr Simpson on the question of contagious propagation, 355

——— Paterson, Mr John, on that of Collieston, . . 408

Chomel, his Clinical Lectures on the Typhoid Distemper, . 492

Christison, Dr, his appendix to report on adulteration of drugs, 321

Cleland, Dr, his Statistics of Glasgow noticed. . . 295

College of Physicians, Edinburgh, report by on the adulteration of drugs, 321

College of Surgeons in Dublin, on their plan to regulate the practice of the apothecaries, . 317

Colquhoun, Mr Ludovic, his Report of the case of David Yoolow, . 530

Consumption, pulmonary, statistical and pathological report on, 1

Creosote, estimate of its merits, 228

Crosse, Mr, his retrospective address, 304

Crowing inspiration, Mr Kerr on, 321

Davidson, Dr William, his surgical report from Glasgow Infirmary, 31

Deafness, observations on its causes and treatment, . . 230

Deafness, on the injection of condensed air in, . . 316

Dick, Dr Robert, on the therapeutic effects of gunpowder, . 312

Drugs, adulteration of, report from the Royal College of Physicians, Edinburgh, . . 321

Dublin, plan of College of Surgeons to regulate the practice of the apothecaries, . . 317

Dupuytren, notice of, . . 222

Ear, Breschet on the anatomy of 244

Eighth pair, on their functions, 109

Euphorbium, Dr Veitch on its medicinal properties, . 483

Farre, Mr W., his almanack, 274

Fetters, on their use as a cause of disease in prisons, . 224

Fever, puerperal, Mr Ingleby on, 412

——- typhoid, M. Chomel on, 492

Fruits, on the red-colour of various, 309

Fungi, cases of poisoning by, 192

Gastric irritability, on the effects of peach tree leaves infusion in, 601

Glasgow, Statistical Account of 295

Glossopharyngeal nerves, on their functions . . 111

Gunpowder, its therapeutic effects 312

Handyside, Dr, his case of wound of throat, &c. . . 209

Heart, on disease of the valves of 257

——— Dr Wardrop's Memoir on its Diseases . . 291

——— on a mode of increasing its action in syncope . 311

Hemorrhages, traumatic, M. Amussat on . . 226

Home, Dr John, his statistical and pathological report . 1

——————— his death noticed 604

Hooping-cough, on infusion of peach tree leaves in . 601

Horses, on the mortality of, in the army, by Mr Marshall, Junior 467

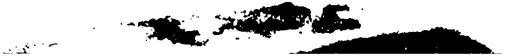
Hutchinson, Mr James, his report on Indian jails . . 589

Hydrocele, acupuncture and iodine, injection in . . 603
Hysterical disorders. *See* Ischuria and . 78, 221, and 438
Idiotism and insanity, on various degrees of . . 230
Idiotry, account of the proceedings in a brieve of . 530
Infirmary, Royal, Edinburgh, Report of cases of consumption from 1
Inflammation, Dr Weatherhead on its nature . . 176
Ingleby, *Mr*, on puerperal fever 412
Iliac artery, state of vessels after ligature of . . 271
Ischuria, hysterical, cases of 78, 221
Jails, Indian, Mr Hutchinson on the sickness and mortality in . 589
Kerr, *Mr W.* on laryngismus stridulus 321
Kramer, his air condenser in cases of deafness . . 314
Laryngismus stridulus, crowing inspiration, Mr William Kerr on, 321
Larynx, Mr Ryland's work on diseases of the, . . 579
Laycock, his cases of hysterical disorder, . 78, 221, and 438
Law, *Mr*, on arsenic in plethora, 313
Leaves, yellow colour of, in autumn 307
——— on their red colour, . 309
Lerminier, notice of, . 223
Lungs, case of anthracosis of, . 490
Luxations, scapulo-humeral, Malgaigne on, . . 229
Maclagan, *Dr D.* on James' powder, 462
Maillot, *M.*, his treatise on pernicious agues in Africa, . 571
Malcolmson, *Mr*, on the effects of solitary confinement and low diet 595
Marshall, *Mr*, *Junior*, on the mortality of horses in the army, . 467
Medico-Chirurgical Transactions, twentieth volume reviewed, . 256
Miescher, *Dr*, his work on bone and its diseases . . 598
Moscow, on the plague of, . 233
Operation, Cæsarean, case of, terminating favourably, . 227
Opium, poisoning by, arrested by artificial respiration, 273
Paterson, *Mr John*, on cholera in Collieston, Aberdeenshire, . 408
Peach tree, on the use of the leaves in medicine, . . 601
Peddie, *Dr*, his cases of poisoning by mushrooms, . 192
Plague, notice on that of Moscow 233
Poisoning, on, by mushrooms, 192
Pneumogastric nerves, on their functions, . . . 130
Powder, James', Dr Douglas Maclagan on its composition . 462
Presentation of face, case of, followed by mortification . 203
Prisons, *vide* Jails, Hutchinson, and Malcolmson. . 589, 595
Processus dentatus, case of fracture not instantly fatal . 265
Puerperal Fever, Mr Ingleby on epidemic . . . 412
Rectum, Dr Bushe on the diseases and injuries of . . 275
Reid, *Dr John*, his experiments on the pneumogastric nerves 109
Renton, *Mr John*, his case of face presentation, &c. . 203
Report, statistical and pathological, from Royal Infirmary, Edinburgh 1
———, surgical, from Royal Infirmary, Glasgow . . 31
——— from Royal College of Physicians, Edinburgh, on adulteration of drugs . . 321
Respiration, artificial, its power in removing the narcotism of opium 273
Richmond, (America, U. States,) analysis of an edible clay from
Ricord, *Dr*, on chancre, . 474
Ryland, *Mr*, his work on diseases of the Larynx. . . 579
Spinal chord, injuries of, classified, 266
Statistical Society, Glasgow and Clydesdale Transactions, . 295
Stratton, *Dr*, his case of anthracosis (spurious melanosis) of the lungs, 490
Sublimate, corrosive, on its effects as a preservative against dry rot, 225
Surgical report from Glasgow Royal Infirmary, . . 31
Syncope, on a mode of resuscitating from, by compressing the arteries of the extremities, . 311
Teel grains, botanical history of 600
Throat, wound of, fatal by the presence of air in the veins, . 209
Tracheotomy, on its use in insensibility from intoxication, . 264
Tubercles, on the pathology of, . 261
Typhus, on its symptoms and morbid anatomy, . . 492
Veitch, *Dr*, *P. D.*, on the medicinal properties of euphorbium, . 483
Wardrop, *Dr*, his memoir on diseases of the heart, . 291
Weatherhead, *Dr G. Hume*, on inflammation, . . 176
Womb, mortification of, after a case of face presentation, . 203
Wound of throat, case of, fatal by introduction of air into the veins, 209
Yelloly, *Dr*, on vascularity of the mucous and serous membranes, 256
Yoolow, *David*, *vide* Idiotry and Colquhoun, . . 530

END OF VOLUME FORTY-NINTH.

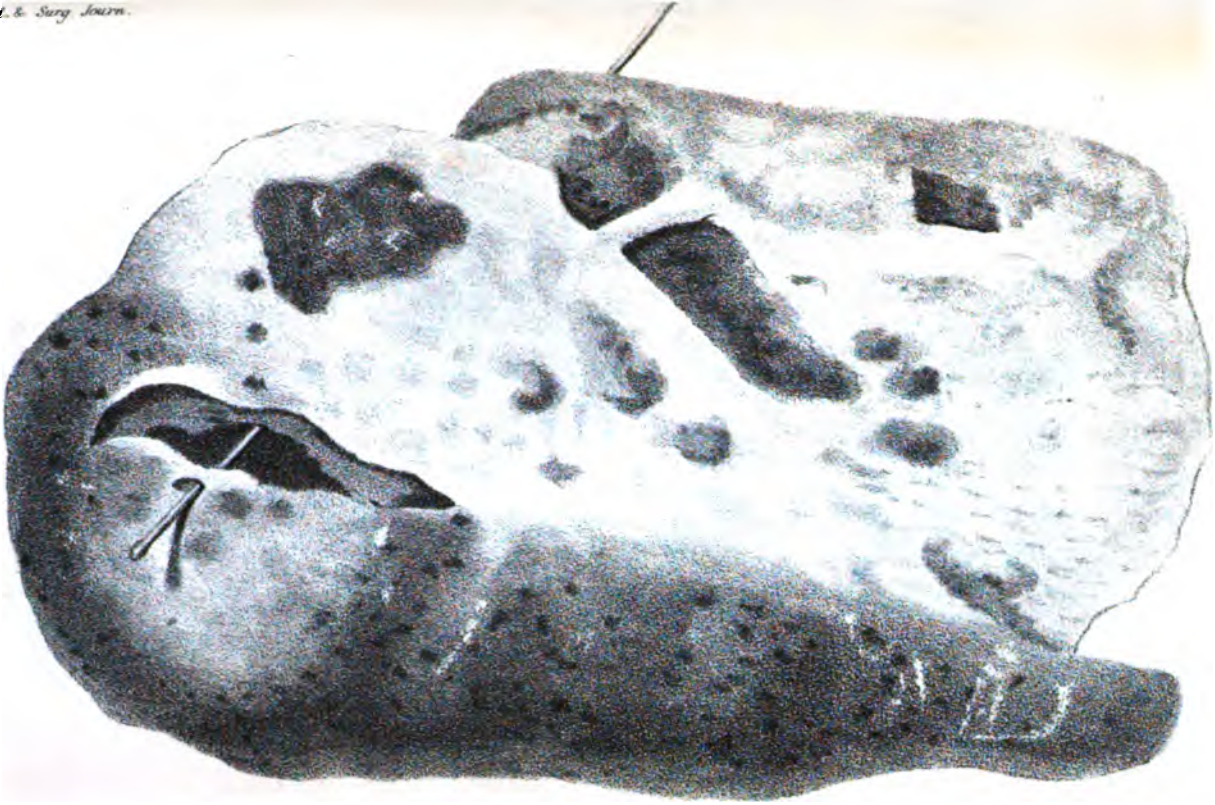
No. CXXXVI. will be published on the 1st of July 1838.

EDINBURGH: PRINTED BY JOHN STARK, OLD ASSEMBLY CLOSE.



Lith: Anst. v. [illegible] [illegible]

Edin^r. Med. & Surg. Journ.



Syme M.D. del^t

Forrester & Nichol lith.

Fig. 1.

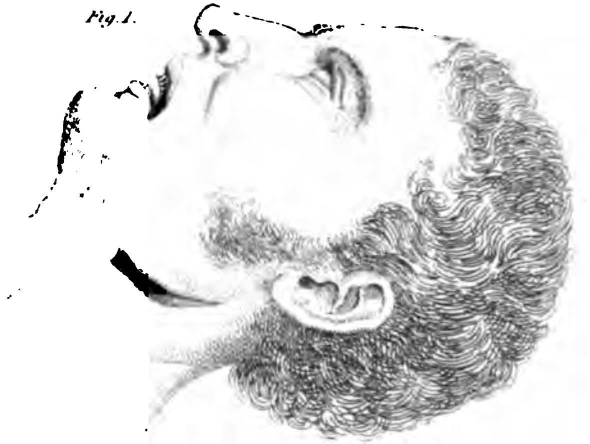


Fig. 2.

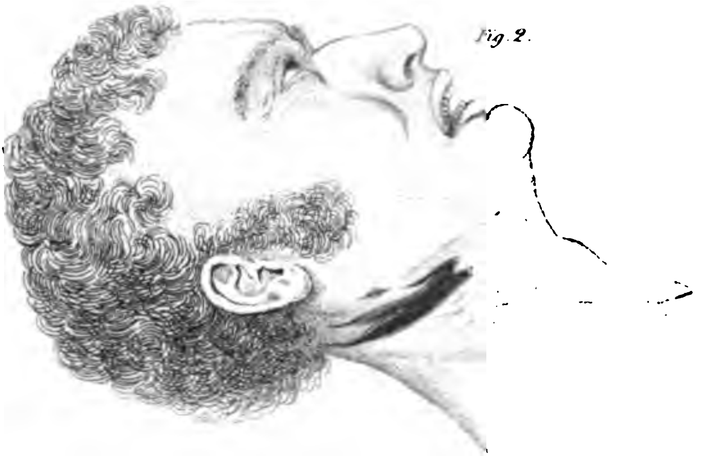
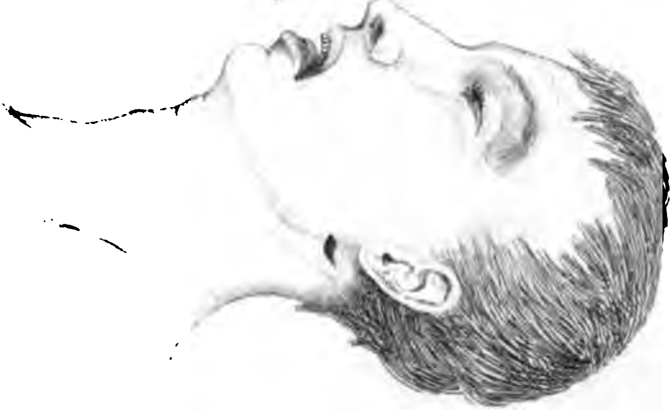


Fig. 3.

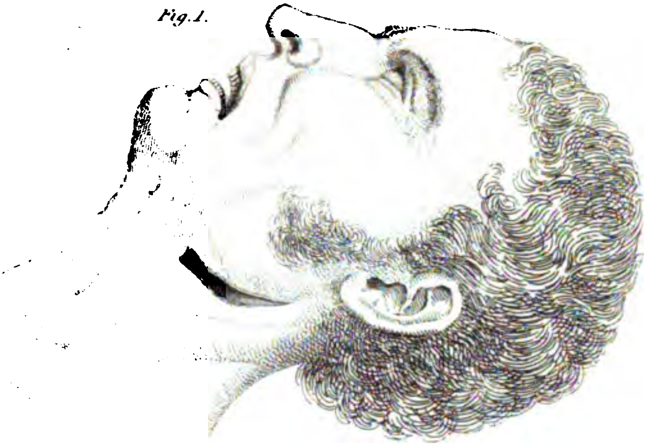


[illegible] del. E. Mitchell Sc.

TO ILLUSTRATE Dr HANDYSIDE'S PAPER.

Edinr Med. & Surg. Journ. *Plate III, p. 209. Vol. XLIX.*

Fig. 1.



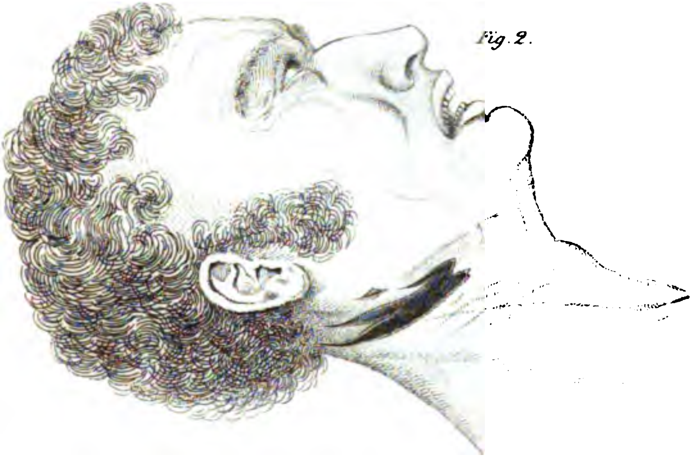
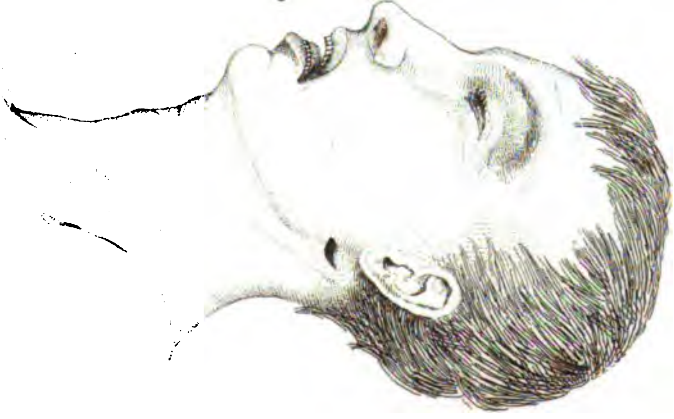


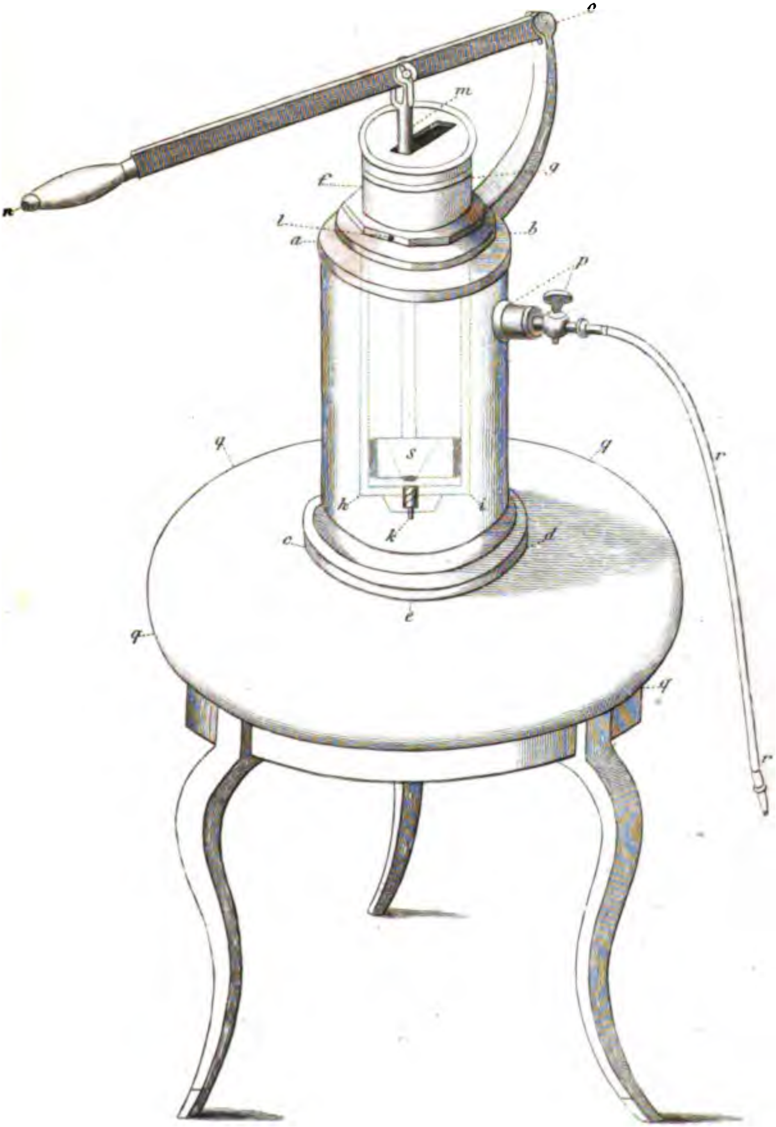
Fig. 2.

Fig. 3.



D^r. KRAMER'S AIR CONDENSER.

Edin^r. Med. & Surg. Journal. Vol. XLIX. Plate IV.



E. Mitchell, Sc.

JUN 1969

WESBY

JUN 1969

WESBY